AECOM

REMEDIAL INVESTIGATION REPORT

FOR THE

EKONOL POLYESTER RESINS SITE

LOCATED AT

6600 WALMORE ROAD, WHEATFIELD, NEW YORK

NYSDEC BROWNFIELD CLEANUP PROGRAM Site No. C932173

December 2021

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NYSDEC BROWNFIELD CLEANUP PROGRAM Site No. C932173

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December 2021

CERTIFICATION

I, James L. Kaczor, P.G. (NY), certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR PART 375 and that this Remedial Investigation Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

James L. Kaczor Q.E.P

DECEMBER 16, 2021 DATE

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LIST OF ACRONYMS AND ABBREVIATIONS

6:2	1H,1H,2H,2H-perfluorooctanesulfonic acid
AMSL	above mean sea level
bgs	below ground surface
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CAMP	Community Air Monitoring Plan
cis-1,2-DCE	cis-1,2-dichloroethene
CPCs	contaminants of potential concern
1,1-DCA	1,1-dichloroethane
DCE	dichloroethene, dichloroethylene
DHB	*Dehalobacter*
DHC	*Dehalococcoides*
DNAPL	dense non-aqueous phase liquid
DO	dissolved oxygen
ELAP	Environmental Laboratory Approval Program
ft	feet
FWRIA	Fish and Wildlife Resources Impact Analysis
GPR	ground penetrating radar
HASP	Health and Safety Plan
HDPE	high-density polyethylene
HHEA	Human Health Exposure Assessment
HSAs	hollow stem augers
IDW	investigation derived wastes
IRM	Interim Remedial Measures
L	liter
LDPE	low-density polyethylene
MEE	methane, ethane, and ethene
MEK	methyl ethyl ketone
mg/kg	milligrams per kilogram (parts per million)
mg/L	milligram per Liter
ml	milliliter
MNA	monitored natural attenuation
mS/cm	milliSiemens per centimeter
mV	milliVolts
MW	monitoring well
NAD	North American Datum
ng/L	nanograms per liter
NGVD	National Geodetic Vertical Datum

NTU	Nephelometric Turbidity Units
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ng/L	nanograms per liter
OM&M	Operation, Maintenance, and Monitoring
ORP	oxidation/reduction potential
PAH	polycyclic aromatic hydrocarbon
PCBs	polychlorinated biphenyls
PCE	tetrachloroethene, perchloroethene, tetrachloroethylene, or perchloroethylene
PFAS	per- and polyfluoroalkyl substances
PFBA	perfluorobutanoic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFPeA	perfluoropentanoic acid
PFOA	perfluorooctonoic acid
PFOS	perfluorooctanesulfonic acid
PFPeA	perfluoropentanoic acid
PID	photoionization detector
RAGs	Risk Assessment Guidance for Superfund
RAR	Remedial Alternative Report
RD	RadioDetection
RI	Remedial Investigation
RIR	Remedial Investigation Report
RIWP	Remedial Investigation Work Plan
SCG	Standards, Criteria, and Guidance
SCOs	Soil Cleanup Objectives
SMP	Site Management Plan
SSD	sub-slab depressurization
SVI	soil vapor intrusion
SVOCs	semi-volatile organic compounds
TAGM	Technical and Administrative Guidance Memorandum
TAL	Target Analyte List
TCE	trichloroethene or trichloroethylene
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TICs	tentatively identified compounds
TOC	total organic carbon

TOGS	Technical and Operational Guidance Series
1,1,1-TCA	1,1,1-trichloroethane
µg/kg	micrograms per kilogram (parts per billion)
µg/L	micrograms per liter (parts per billion)
µg/m3	micrograms per cubic meter
UFPO	Underground Facilities Protection Organization
USCS	Unified Soil Classification System
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
VC	vinyl chloride
VCP	Voluntary Cleanup Program
VOCs	volatile organic compounds

1. INTRODUCTION

1.1 Purpose

On behalf of Elm Holdings Inc., c/o Remediation Management Services Company, AECOM Technical Services Inc. (AECOM), performed environmental site investigation activities at the Ekonol Polyester Resins Brownfield Cleanup Program (BCP) Site (No. C932173) located at 6600 Walmore Road in the Town of Wheatfield, New York (**Figures 1-1**). The purpose of the investigations, and this Remedial Investigation Report (RIR), was to characterize the current state of soil and groundwater conditions at the site, confirm the concentrations of known constituents at the site, and to collect data on the list of BCP required contaminants of concern, some of which had not been sampled for previously at the site. This report presents the data and information collected during the Remedial Investigation (RI) field investigation that took place from September 8, 2020 through October 2, 2020.

1.2 Scope of Work/Objectives of the RI

Investigation activities for this RI were initiated following transition of the Site from the Voluntary Cleanup Program (VCP) to the BCP (see Section 2.4 for additional information associated with VCP activities). The Site has been accepted into the BCP pursuant to the Brownfield Cleanup Agreement (BCA) between New York State Department of Environmental Conservation (NYSDEC) and Elm Holdings Inc, (Participant), dated May 30, 2019.

Following acceptance into the BCP, a remedial investigation work plan (RIWP) was developed to address data gaps at the Site that were identified as necessary for the BCP and included an investigation assessing subsurface conditions throughout the remainder of the BCP parcel. In addition to volatile organic compounds (VOCs), the RI analytical list was expanded to include semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCB), pesticides, metals, and emerging contaminants per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane. A draft RIWP was submitted to NYSDEC on October 4, 2019. NYSDEC/New York State Department of Health (NYSDOH) comments were received June 4, 2020. Response to comments were provided on July 8, 2020, and the final RIWP (AECOM, 2020) was submitted on August 11, 2020 in accordance with DEC approval of response to comments.

On October 5, 2020, during completion of this RI, NYSDOH submitted a review letter to NYSDEC regarding the August 2020 Final RIWP with additional comments. NYSDEC provided the NYSDOH letter to AECOM of February 9, 2021 and recommended "assessing the potential for soil vapor intrusion (SVI) in the off-site buildings that are underlain by chlorinated degradation products in groundwater" and requested confirmation of the working status of the existing sub-slab depressurization (SSD) system located in the main office building at the Site. AECOM submitted a letter work plan for the SVI assessment to NYSDEC on March 11, 2021.

The investigation results presented in this RIR, together with data from previous investigations, Interim Remedial Measures (IRM), and periodic monitoring events conducted under the VCP will be used to develop remedial action objectives and support the selection of an appropriate remedial action to address contamination related to the Site.

Project objectives for this RI included:

- Evaluate potential data gaps in soil and groundwater within the BCP site for possible presence of contaminants (VOCs, SVOCs, metals, PCBs, pesticides and the emerging contaminants 1,4-dioxane and PFAS);
- Complete a round of groundwater sampling using the previously approved VCP Site Management Plan (SMP) semi-annual monitoring list to evaluate the current status of VOC concentrations and ongoing effectiveness of VCP-based Remedial Actions;
- Complete indoor and outdoor air sampling in the manufacturing building office area to assess the potential for SVI of Site-related VOCs;
- Confirm the working status of the SSD system at the Site;

- Evaluate the hydrogeologic environment for reductive dechlorination using select overburden and bedrock wells and laboratory and field kit analyses;
- Evaluate the areal and vertical extent of contamination, including transport mechanisms to allow for fulfillment of NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (DER-10, NYSDEC, 2010a) Appendix 3B Qualitative Human Health Exposure Assessment;
- Evaluate, qualitatively, actual and potential exposures associated with site-related contaminants on and off-site;
- Assess potential or actual threats to public health and the environment, including potential or complete exposure pathways for human health and fish and wildlife resources per DER-10;
- Assess the on-site source(s) of possible contamination and determine if this source(s) has impacted off-site properties; and,
- Collect additional data to support the design and implementation of remedial actions.

2. BACKGROUND

2.1 Site Description and Features

The BCP Site is a 1.006 acre area located at 6600 Walmore Road, approximately one-half mile north of Niagara Falls Boulevard (NYS Route 62), in the Town of Wheatfield, Niagara County, New York. The Site is located immediately south of the Ekonol Polyester Resins facility building. The Ekonol Polyester Resins facility is an active manufacturing facility currently operated by Saint-Gobain Ceramics and Plastics, Inc. (current leaseholder), and located in a building at the northeast end of a larger, active industrial parcel. The western approximately two-thirds portion of the building that houses the Ekonol Polyester Resins facility is vacant. The investigation area, immediately south of the Ekonol building is currently asphalt and concrete and has been primarily used for parking and equipment storage for the nearby manufacturing facility. The term “Site” herein includes the area outlined in red on **Figure 2-1**.

During the VCP, a set of overburden bioreactor trenches was installed immediately south and east of a former underground storage tank (since removed; see Section 2.4 for additional description). Outside of the BCP Site boundary, additional industrial buildings and asphalt and concrete pavement are present. Further south beyond the additional industrial buildings, the southern portion of the parent parcel is undeveloped and consists of open brush and grass, gravel roadways, and asphalt and concrete pavement (**Figure 2-2**).

The topography at the facility is relatively flat and located at an approximate elevation of 600 feet above mean sea level (ft AMSL). The facility receives its potable water supply from the Town of Wheatfield, New York. A chain link fence surrounds the property. The fence includes a secure vehicle access gate.

2.2 Site History and Land Use

The Site is within a general industrial (zoning) area of the Town of Wheatfield and is comprised of a portion of the approximately 15.10 acre parcel No. 146.00-10-9.21. Parcel No 140.00-10-9.21 is a sub-parcel divided off as a condo from the parent parcel 146.00-1-9.2 listed on the Town of Wheatfield Tax Map. The parent parcel is 55.10 acres. As depicted on the Town of Wheatfield Zoning Map adopted January 31, 2018, The Site is located in the following zoning district(s): M-2, Industrial-2, and O-3, Airport Zone One Overlay. Consistent with this zoning, Niagara County tax records indicate the property use is identified as light industrial manufacturing. The reasonably anticipated future use of the Site is industrial/manufacturing.

The Ekonol Polyester Resins building was historically (and is currently) used for production of a polyester resin that is used as a spray-on coating for turbine engines. The Carborundum Company opened operations at the polyester resins facility in May 1963. A series of corporate ownership changes (sales and mergers) occurred over the next several decades, including sale of the property at 6600 Walmore Road. Operations of the polyester resins facility was maintained by the Carborundum Company (operating as a subsidiary under the umbrella of British Petroleum) up until 1996 when operations were sold to Saint-Gobain, the current operator.

An underground concrete tank was used at the Ekonol facility from the mid-1970s through 1999 for collection of wastewater rinsate from the floor drains inside the process area of the plant. This tank was constructed of reinforced concrete walls, approximately 9.5 inches thick, and was approximately 18 feet long, 6 feet wide, and 9 feet deep (a volume of approximately 7,800 gallons). During the 1999 tank removal, trichloroethene (TCE) in soil was detected at concentrations ranging from 1.2 to 200 milligrams per kilogram (mg/kg), cis-1,2-dichloroethene (DCE) concentrations ranged from 2.9 to 100 mg/kg. Phenols were detected at concentrations ranging from 4.5 to 12.0 mg/kg. Following removal of the tank, additional excavation was completed to remove contaminated soils surrounding the tank. Approximately 180 cubic yards of material were removed from an excavation that was approximately 29 feet long, 16 feet wide and 12.7 feet deep (top of the bedrock surface).

2.3 Adjacent Property Land Use

The Site is located to the east of the Niagara Falls International Airport, north of a parcel formerly known as the Bell Aerospace facility currently owned by Wheatfield Business Park II, LLC, and Niagara Falls Boulevard (NYS Route 62), and to the south of the Niagara Falls Air National Guard Base. Properties to the east of Walmore Road are primarily zoned industrial; however, residential properties do exist on the east side of Walmore Road east-southeast of the site (**Figure 2-3**).

2.4 Previous Investigations

Site investigation and remediation activities have been ongoing at the Site since the 1999 removal of the underground concrete tank just south of the Ekonol Polyester Resins building. After the tank closure and soil excavation, a multi-phase Site Characterization Study and series of IRMs were completed prior to and following entry into New York's VCP in 2003 (VCP Site No. V00653-9).

The findings of multiple studies revealed that the main constituents of concern are chlorinated VOCs (TCE and breakdown products) historically found at high concentrations in soil, overburden and bedrock groundwater in the area of the former concrete tank. While the source of the contamination (tank and associated soils) was removed, impacts to overburden soil and bedrock groundwater remained. The extent of bedrock groundwater VOC impact has been determined with concentrations highest near the former underground concrete tank and progressively decreasing to non-detect values in downgradient wells south of the former tank area. Bedrock groundwater impacts are essentially limited to within the 6600 Walmore Road property boundary. Site contaminants were also found in sub-slab soil vapor under the office area of a manufacturing building on the parent property. Existing Site wells from the various investigations, IRMs, and remedies are indicated on **Figure 2-2**. Construction details for existing historical wells installed during previous investigations and remedial actions plus the new wells installed during this RI are presented in **Table 2-1**.

There are multiple historical sampling events for targeted VOCs, SVOCs, and metals; however, prior to this remedial investigation, there were limited samples for the full Target Compound List (TCL) VOCs, SVOCs, Target Analyte List (TAL) metals, and a lack of data on PCBs, pesticides and the emerging contaminants 1,4-dioxane and PFAS, which are necessary to fully characterize the site for the BCP. A summary of historical soil exceedances of contaminants at the site is presented in **Figure 2-4** (Historic Soil). There is a large amount of data from numerous sampling events for target contaminant VOCs at the site; therefore, to give a historical snapshot of the VOC conditions at site prior to the 2020 RI VOC results from the last groundwater sampling event (spring 2018) are presented in **Figure 2-5** (Overburden), and **Figure 2-6** (Bedrock) (AECOM, 2018). Historical SVOC exceedances in groundwater are presented in **Figure 2-7** (Overburden) and **Figure 2-8** (Bedrock). More complete VOC and SVOC summary tables of historical groundwater monitoring results and concentration of chloroethene trends are presented in **Appendix A**. Historical groundwater exceedances of sampled metals are shown on **Figure 2-9** (Overburden) and **Figure 2-10** (Bedrock). Results of a SVI study from 2009 and a check of the existing SSD system in 2015 are presented on **Figure 2-11**. The 2020 RI results are presented in **Section 5** below.

Brief summaries of historical investigations, reports, and remedial work are outlined in the subsections below.

2.4.1 Underground Storage Tank Closure Report July 2000

This report detailed the August 1999 removal of the underground storage tank and excavation efforts during the removal of the tank (Frontier Technical Associates, Inc., 2000). The concrete tank was sampled for Toxicity Characteristic Leaching Procedure (TCLP) volatiles and semi-volatiles; sample results indicated the concrete tank needed to be disposed of as hazardous waste due to TCE presence in the concrete. Water encountered during the removal process was collected and sampled. Excavation of surrounding clay soils and stone backfill from around the tank and inlet pipes was completed. The area was excavated to bedrock at around 12.67 feet below ground surface (bgs) and until dry clay was noted in the sidewalls. TCL VOC and SVOC compounds were collected from the sidewalls approximately 3 feet up from the top of bedrock. Based on these results, additional soil excavation took place in October 1999 and all soil assumed hazardous and shipped for offsite disposal as such. The excavation was halted after a cave in due to proximity to the building foundation. Residual contamination remained in the surrounding soils.

2.4.2 Phase I Site Characterization Report– February 2001

A Phase I Site Characterization (Parsons, 2001) investigated the extent of impacts on soil and groundwater near the former concrete tank. The Phase I activities took place in November 2000 and included soil borings, temporary well installations, soil and groundwater sampling, and surveying. In soils, VOC concentrations for TCE and total 1,2-DCE and the SVOCs aniline and phenol were above NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 cleanup objectives in some samples (NYSDEC, 1994). In groundwater, multiple VOCs, three SVOCs, lead, and zinc were above respective standards of the time. The highest concentrations were observed near the former containment tank and associated piping. The Phase I work was summarized and presented to NYSDEC. NYSDEC reviewed the report and requested further characterization of soil and groundwater.

2.4.3 Phase II Site Characterization Report – March 2003

A Phase II Site Characterization (Parsons, 2003) addressed NYSDEC comments on the Phase I report. Phase II field activities took place in December 2001 and included additional soil borings, soil sampling with groundwater field screening, overburden and bedrock monitoring well installation, groundwater sampling, and an investigation of site sewers. Field and analytical data from the Phase II characterization showed impacts to groundwater, including a dense non-aqueous phase liquid (DNAPL), and further defined the extent of impacts to groundwater in overburden and deeper bedrock groundwater. After reviewing the Phase II data, NYSDEC concurred that additional work was warranted for groundwater in the bedrock.

2.4.4 Voluntary Cleanup Program – June 2003

On June 27, 2003 NYSDEC accepted the Site into the VCP (VCP Site No. V00653-9). This program was designed to enhance private sector cleanups and address environmental, legal and financial barriers that often hinder the redevelopment of contaminated properties (NYSDEC, 2002).

2.4.5 Phase III Site Characterization Report – January 2004

The Phase III Site Characterization (Parsons, 2004a) activities took place in September-December 2003 and included additional groundwater field screening, bedrock monitoring well installation and packer testing, and groundwater sampling to investigate impacts to groundwater in bedrock. Samples were collected for targeted VOCs and SVOCs. The results indicated the extent of the dissolved phase groundwater plume was reasonably defined but additional information was required. The report concluded that the groundwater plume was defined to the north, west, and northeast, but additional data was needed to the east across Walmore Road and to the south within the parent property boundary. Additionally, the report included a qualitative exposure assessment which described the potential exposure setting, exposure pathways, and fate and transport of site constituents of concern.

2.4.6 Supplemental Phase III Site Characterization Report – September 2004

The Supplemental Phase III Site Characterization (Parsons, 2004b) activities took place in July 2004 and included installation of temporary off-site bedrock wells, installation of two additional off-site groundwater monitoring wells, groundwater screening, and two rounds of groundwater sampling from all site related wells. The supplemental report also updated the qualitative exposure assessment to include the results of the Supplemental Phase III sampling.

2.4.7 Remedial Alternative Report including Addendums and Bench Scale Testing – February 2006, December 2006, and June 2007

The Remedial Alternatives Report (RAR; Parsons, 2007) evaluated different options for remediation at the site which lead to bench scale testing. Two letter addendums added information to the original RAR. The RAR focused on remediation of site groundwater given that the soils immediately around the former tank had already been excavated. These documents concluded that an enhanced reductive dechlorination "bioreactor trench" was the proposed treatment for overburden groundwater and that, of the options reviewed, in-situ enhanced reductive dechlorination bioremediation was determined to be the most viable and cost-effective technique for bedrock groundwater.

2.4.8 Pilot Test Report – April 2009

Field work for the pilot test (Parsons, 2009a) took place between November 2007 and December 2008. Initial remedial actions included pilot testing, and performance monitoring groundwater sampling after the pilot test (Parsons, 2009b; Parsons, 2009c; Parsons, 2010), which demonstrated appreciable molar reduction of TCE, DCE, and vinyl chloride (VC). Observations of DNAPL, moderately low pH, elevated sulfide and groundwater transport rates were determined to be factors influencing bioremediation. Based on the results of the pilot studies, applicability and cost, bioremediation was selected and approved as the preferred alternative.

2.4.9 Soil Vapor Intrusion Air Sampling – June 2009 / Fall 2015

Due to the known presence of contaminants released into soil and groundwater at the site and known TCE within overburden groundwater, the NYSDEC sent a letter in January 2009 suggesting an SVI assessment be conducted in the office building area of the Saint-Gobain facility. The Saint-Gobain offices were downgradient of the source plume. The Ekonol building located to the north and in an upgradient groundwater flow direction was not sampled. Indoor, sub-slab, and outdoor air samples were collected in February 2009 (GZA, 2009). TCE, tetrachloroethylene (PCE), and cis-1,2-DCE were detected at concentrations above method detection limits. Results were compared to the NYSDOH Soil Vapor Intrusion Guidance document matrices (NYSDOH, 2006 and amendments to 2009). PCE concentrations detected within the sub-slab samples required mitigation according to the decision matrices. An SSD system was installed in the Saint-Gobain office building in November 2010 and inspected quarterly according to the approved site Operation, Maintenance, and Monitoring (OM&M) plan (Parsons, 2011).

A January 2016 letter to the NYSDEC detailed additional sampling of the SSD system with the system running (August 2015) and off (October 2015) for 24-hours with all sampled VOCs being non-detect (Parsons, 2016). In accordance with the February 22, 2011 NYSDEC and NYSDOH-approved Sub-slab Depressurization System Operations, Maintenance, and Management Plan for the Ekonol Polyester Resins Site, the 2015 sampling was performed on the SSD system to determine if cessation of operation of the SSD system could be proposed. Two samples of sub-slab vapor were collected from the SSD system in 2015. Samples were analyzed for VOCs using Environmental Protection Agency (EPA) Method TO-15. The first sample was collected with the system running in August 2015. Following the receipt and review of the non-detect results of the first sample, the second sample was collected in October 2015 24-hours after the system was shut down. The results for each of the 2015 sample events collected from the SSD system were below method detection limits for all constituents of concern suggesting that the SSD system was successfully mitigating constituents of concern in sub-slab vapor to a concentration no longer expected to impact indoor air quality as it relates to the project constituents of concern. The January 2016 letter requested approval to decommission the SSD system. This approval was not provided, and the SSD system has been operated and maintained without interruption since. The SSD system will continue to operate until termination is approved by NYSDEC/NYSDOH.

2.4.10 Proposed Decision Document 2010

The Proposed Decision Document (NYSDEC, 2010b) suggested a remedy for the site which included a passive bioreactor for the treatment of shallow groundwater by enhancing the degradation of the contaminants. The trenches were designed to create a preferential pathway for overburden groundwater flow with groundwater-mulch contact enhancing natural biodegradation of site contaminants. Deep Groundwater was proposed to be addressed via injections of emulsified vegetable oil into the bedrock aquifer, and then monitored to assess if additional injection treatments were necessary to achieve biodegradation of site contaminants.

2.4.11 Remedial Actions 2010-2011

Full-scale remedial actions were implemented as IRMs in overburden and bedrock between 2010 and 2011. The bioreactor suggested in the 2010 Proposed Decision Document was installed and is comprised of two parallel trenches excavated to bedrock (approximately 15 feet bgs), filled with a mixture of gravel and organic wood-chip mulch, covered with a non-woven geotextile to prevent fines from entering the bioreactor, additional gravel, and a high-strength woven geotextile. If soil was from the top 6 feet of the bioreactor excavations, was from above the water table, and if samples tested and met the DER–10 guidance values for the reuse of soil, then that soil was used as backfill for the bioreactor excavation. The two trenches were segmented into 4 parts each, leaving soils in place around existing utilities. Mulch provided organic substrate to support the microbiological growth and enhance the rates of the in-situ biodegradation of the constituents of concern. The limestone gravel mixed with sand for iron supply in the bioreactor provided geotechnical strength, permeability, and had the additional purpose of limiting reduction of hydraulic conductivity. Emulsified vegetable oil (SRS-FR® - a proprietary vegetable-oil substrate with emulsifiers) was added to the media during installation. Additionally, 18 bioreactor monitoring wells (OR-1SI- through OR-18SM) were installed in overburden in the bioreactor trench area. Eleven new overburden performance monitoring wells were also installed within and around the bioreactor trench area.

The emulsified vegetable oil injections for bedrock groundwater treatment were also completed. Eight new bedrock injection wells (INJ-6D through INJ-13D) were installed in the bedrock in the target treatment area. The SRS-FR® emulsified vegetable oil (carbon source), and other additives to the injection substrate, sodium bromide (increase conductivity) and sodium bicarbonate (pH buffer) was used to create conditions in the groundwater favorable to biodegradation of site contaminants. Bioaugmentation (*Dehalococcoides* [DHC] and *Dehalobacter* [DHB] species) was added to INJ-06D near the end of that location's injection. Nine new bedrock performance monitoring wells were also installed within and around the targeted bedrock remediation area.

Performance monitoring of the remedy took place after completion of the remedial actions to monitor the remedy and plan additional injections if needed to boost enhanced degradation. Performance monitoring tracked geochemical conditions for anaerobic dechlorination and looked at evidence of enhanced in situ degradation of TCE to DCE, VC, and ultimately ethene and ethane. Post remedy, concentrations of all chlorinated VOCs within the bioreactor trenches were notably lower than upgradient and downgradient well locations. Outside the bioreactor trenches there were both increases and decreases, with increases likely due to short-term degradation product increases. Bedrock wells that were located farthest downgradient and side gradient showed no changes in concentrations, relative to background in the first six months following the remedy.

2.4.12 Construction Completion Report and Initial Performance Assessment – August 2012

A Construction Completion Report (Parsons, 2012) was prepared for the overburden bioreactor and bedrock enhanced reductive dechlorination remedial actions. The report was prepared in accordance with DER-10, was submitted to NYSDEC, and was approved.

2.4.13 Supplemental Remedial Actions – November 2012

As part of a supplemental remedial action, in November 2012, further SRS-FR® substrate injections were completed on the western side of the injection area in the bedrock treatment zone (INJ-7D, INJ-9D, INJ-10D, and INJ-13D). Injections were to increase total organic carbon (TOC), which was nearly depleted in some wells, buffer pH in areas where it was low, and increase the microbial populations (using bioaugmentation) to support reductive dechlorination. RNAS-Neutral Zone®, a proprietary calcium carbonate buffer solution was used instead of sodium bicarbonate to provide a more long-term buffer for pH. However, performance monitoring following the injections reported that the added carbonate buffer appeared to lack enough buffering capacity to prevent an initial pH drop following injections, though the pH of most wells in the area recovered with time (by April 2014). During this additional action, changes in buffer and addition of iron were tested in INJ-07 to determine if the remedy could be improved and hydrogen sulfide concentrations reduced. Also, additional bench scale testing was completed.

2.4.14 Performance Monitoring Reports 2012-2018

Following completion of the remedial actions, performance monitoring reports were prepared from 2012 through spring 2018. Initial performance monitoring, evaluation, and reporting was performed on a quarterly basis. In 2015, performance monitoring, evaluation, and reporting was moved to a semi-annual basis.

Performance monitoring after the remedy indicated that in general the conditions appropriate for anaerobic in situ bioremediation were met for the overburden bioreactors in wells in the trenches and that target VOC concentrations decreased compared to pre-treatment levels. TCE was generally depleted from the shallow groundwater within approximately the first six months of completion of the bioreactor installations. In spring 2018 (the last monitoring event before the site entered the BCP), TCE was below detection limits at all locations within the bioreactor except for a low detection on the western side of the southern trench (OR-4SM). Concentrations of cis-1,2-DCE and VC declined during the first year of monitoring and remained below pre-treatment concentrations, except for decreasing but cyclical behavior in two bioreactor wells in the southern trench (OR-6SM and OR-10SM). Other locations within the bioreactor trenches demonstrate very low concentration to non-detect results for chlorinated VOCs.

Outside of the bioreactor trenches overburden shallow groundwater results were more variable and exhibited a range of target VOC concentrations. Overall, overburden wells outside the bioreactor trenches with higher chlorinated VOC concentrations correspond to higher oxidation-reduction potential (ORP) levels, low TOC, and lower extents of sulfate reduction (which would occur with active bioactivity). However, the presence of appreciable levels of VC and ethene indicate that some biodegradation has occurred and/or such degradation products have migrated from the upgradient active bioreactors.

In the bedrock treatment area and downgradient of the bedrock treatment area monitoring results show enhanced chlorinated VOC biodegradation immediately downgradient of the November 2012 treatment area and indicate degradation is incomplete but ongoing in the bedrock. During the last monitoring event prior to this RI (spring 2018) trends for TCE (where present) remained steady or decreased. DCE and VC concentrations showed a decreasing trend or occurred at concentrations within the range of recent monitoring events. All monitored bedrock wells show increased ethene and ethane concentrations (one to three orders of magnitude) from September 2012 (i.e., prior to the November 2012 injections) to spring 2018 inferring anaerobic dechlorination. The data prior to this RI suggested that as of the spring 2018 monitoring event biodegradation was still taking place but possibly occurring at a decreased rate at some locations. See **Section 5** below for a summary of the current state of the groundwater plume.

2.4.15 VCP Site Management Plan July 2015

An SMP was developed and submitted to NYSDEC in July 2015 (Parsons, 2015). The SMP outlined the long-term Institutional and Engineering Controls, OM&M, and reporting requirements for the Site. A deed restriction for the site dated May 22, 2014 was included as an attachment in the SMP. No comments or formal NYSDEC approval were received on the submitted SMP. The recommended OM&M plan presented in the SMP was implemented as of fall 2015.

2.4.16 Revised Decision Document and Fact Sheet February 2018

The NYSDEC prepared and posted a Fact Sheet in February 2018 for public comment. The fact sheet announced a public comment period on the Proposed Plan and provided a summary of site investigations, remedial actions, and long-term monitoring for the Site. Based on the completed actions and monitoring of the reductions in Site contaminants, the fact sheet announced that “No Further Action” was being proposed by the NYSDEC as the remedy for the Site. The “No Further Action” remedy included the following:

1. The continued operation and maintenance of the enhanced bioremediation systems and the sub-slab depressurization system;

2. Placement of a Deed Restriction on the site restricting it to commercial or industrial use. The Deed Restriction was filed with the Niagara County Clerk’s Office on May 22, 2014;

3. Development of a Site Management plan that includes the following: (a) An Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure that the institutional and engineering controls remain in place and effective; (b) An Excavation Plan that details the provisions for management of future excavations in areas of remaining contamination; (c) An evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion; (d) A Monitoring Plan to assess the performance and effectiveness of the remedy that will include monitoring of soil vapor, indoor air and groundwater; and (e) An Operation and Maintenance Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy (NYSDEC, 2018).

2.4.17 Transition from the VCP to the BCP – 2018

In November 2016, NYSDEC announced the planned phase-out of the VCP by June 28, 2018. On May 25, 2018, NYSDEC notified Elm Holdings Inc. that the site was not going to receive a certificate of completion under the VCP and that the site should transition to another regulated program. Elm Holdings Inc. applied to enter the Site into the BCP. The application was accepted, and the BCA was executed in May 2019.

Investigation and remediation activities conducted under the VCP to that point had been focused on VOCs. However, the BCP requires that a broader range of potential site contaminants be investigated. The investigation conducted for this RI included additional activities to evaluate the possible presence of additional contaminants, and the results discussed herein take into account the BCP requirements while also comparing groundwater results to similar analyses required as part of the SMP for the Site when it was a part of the VCP.

3. REMEDIAL INVESTIGATION ACTIVITIES

This RIR includes the collection of soil and groundwater samples which were analyzed for VOCs, SVOCs, PCBs, pesticides, metals and the emerging contaminants 1,4-dioxane and PFAS across the BCP Site.

The following activities were completed during the RI to fulfill the project objectives and address existing data gaps necessary for compliance with the BCP. Each of the RI sample points are presented in **Tables 3-1 and 3-2** and on **Figures 3-1 and 3-2**.

- Completed nine soil borings (SB2020-01 through SB2020-09) in select areas of the Site for further characterization of soil, specifically regarding data gaps for TCL VOCs, SVOCs, PCBs, pesticides, TAL metals, and 1,4-dioxane and PFAS at the Site.
- Completed two of the above soil boring locations as new monitoring wells (MW), one shallow and one bedrock (MW-13S and MW-22D), to expand the existing monitoring well network and to characterize groundwater data gaps for TCL VOCs, TCL SVOCs, PCBs, pesticides, total metals, and 1,4-dioxane and PFAS.
- Collected subsurface soil samples at each of the nine new soil borings/monitoring well boring locations. Surface soil was not collected as the site is entirely covered with asphalt pavement.
- Collected 12 groundwater samples (6 overburden and 6 bedrock) using the 2 new BCP RI monitoring wells (one overburden and one bedrock) and 10 pre-existing VCP monitoring wells (5 overburden and 5 bedrock) within the BCP Site to address data gaps in groundwater; samples were analyzed for TCL VOCs, TCL SVOCs, PCBs, pesticides, TAL metals, and 1,4-dioxane and PFAS, and any additional field kit parameters as needed to evaluate current site groundwater status (See **Table 3-1** and **Figure 3-2**). These wells were also sampled for reductive dechlorination laboratory analyses (methane ethane, ethene, dissolved iron, dissolved potassium, total organic carbon, sulfate, and sulfide). Three of these 12 wells were sampled for microbial analyses (DHC and DHC functional genes).
- Collected 31 groundwater samples from monitoring wells located within (20) and outside (11) the current BCP Site footprint using the former VCP Site monitoring well network to evaluate the current status of the VCP-defined VOC plume and the ongoing effectiveness of VCP remedial actions. Samples were analyzed for the same parameters as the previous VCP Site SMP Fall Semi-Annual monitoring list, including: VOCs; reductive dechlorination laboratory analyses (methane ethane, ethene, dissolved iron, dissolved potassium, total organic carbon, sulfate, and sulfide); and, field kit analyses (hydrogen sulfide, alkalinity, carbon dioxide, and ferrous iron). Nine of the 31 wells were sampled for microbial analyses (DHC and DHC functional genes). The monitoring wells sampled as part of this list are presented in **Table 3-2** and **Figure 3-2**.
- Analyzed subsurface soil samples for TCL VOCs, SVOCs, PCBs, pesticides, TAL metals, and 1,4-dioxane and PFAS to address data gaps in soil data.
- Collected an indoor SVI and an outdoor air sample at the main office building. Evaluated the results from the above sampling programs on and near the BCP Site to investigate the future need for additional SVI evaluation and system changes at any of the manufacturing or office buildings.
- Collected groundwater levels from all wells to evaluate the direction of groundwater flow.
- Reviewed previous aquifer characterization testing on select Site monitoring wells to evaluate hydraulic properties in the overburden and evaluate remedy methods for soil and groundwater.
- Surveyed the new monitoring well and soil boring locations.
- Properly manage and dispose investigation-derived waste (IDW).

3.1 Utility Clearance

On September 10 and 11, 2020, AECOM subcontractor Applus RTD (Applus) mobilized to Site to identify subsurface utilities prior to RI drilling activities. AECOM staff marked out the intended drilling locations with spray paint and performed a site-walk with the Applus representative. Applus utilized ground-penetrating radar (GPR) and RadioDetection (RD) surveys at the Site and marked out utilities directly on the pavement/ground surface. Applus documented the survey in a report, a copy of which is provided in **Appendix B**

AECOM also reviewed facility plans to identify underground utilities. Additional public utility clearance was performed by the drilling contractor SJB Services Inc, (SJB) by notifying the Underground Facilities Protection Organization (UFPO). Also, each boring was manually precleared using non- mechanical means such as a hand auger to a depth of approximately 5 feet prior to drilling.

3.2 Community Air Monitoring

In accordance with the Community Air Monitoring Plan (CAMP) for VOCs and particulates, monitoring was performed for ground intrusive activities associated with the Site, including, the installation of soil borings and groundwater monitoring wells. CAMP monitoring was performed according the guidance outlined in the RIWP and as in the AECOM site-specific Health and Safety Plan (HASP), NYSDOH Generic CAMP, and NYSDEC DER-10 Guidance. VOC and dust particulates were monitored continuously at the upwind and downwind perimeters of the work area at temporary particulate monitoring stations which consisted of one MiniRae 3000 PID and one Dusttrak II 8530 per station. In addition to using the particulate monitors, fugitive dust migration was visually assessed during work activities.

At the start of the workday on September 21, 2020, the downwind Dusttrack II 8530 recorded average particulate levels greater than the required threshold of 100 micrograms per meter cubed (µg/m^3) above background for the first two 15-minute intervals after startup. The field technician performed a re-zero of the unit. The elevated readings are believed to be an equipment malfunction and not related to site activities. There were no other exceedances of VOCs or particulate during CAMP monitoring. Upwind and downwind monitoring station results and locations are presented in **Appendix C**.

3.3 Emerging Contaminants (1,4-dioxane and PFAS) Considerations

In March 2019, NYSDEC issued a memo requiring sampling of all environmental media and subsequent analysis for the emerging contaminants 1,4-dioxane and PFAS as part of all remedial programs implemented under 6 NYCRR Part 375. In compliance with the memo, sampling locations for the BCP program included the emerging contaminants in the analysis list for this RI.

The twelve sample locations selected for the RI to address gaps in TCL/TAL data required for the BCP were also analyzed for the emerging contaminants in accordance with the RIWP.

PFAS sampling was conducted by AECOM employees trained in AECOM-specific PFAS sample protocol in accordance with the NYSDEC guidance documents listed above.

Water used for drilling and decontamination of drilling tooling was collected from a potable water spigot provided by the facility. According to the facility manager, the spigot was from the Town of Wheatfield water supply, which the town obtains from Niagara County. The County sources the water from the western side of the Niagara River. A sample for Drilling Water was collected from the spigot and submitted to the laboratory for PFAS analysis.

3.4 Drilling and Well Installation

3.4.1 Soil Sampling Drilling Activities

Drilling services took place between September 21, 2020 and September 24, 2020 and were provided by SJB. Drilling of the nine soil borings was performed using a 6620DT Track Mounted Geoprobe® direct-push drill rig. Following completion of the direct-push borings, drilling for the one new overburden monitoring well and one new bedrock monitoring well was performed adjacent to the direct-push pilot hole locations using a truck-mounted CME 75 drill rig and 4 ¼-inch hollow stem augers (HSAs) for the overburden well (MW-13DS) and 6 ¼-inch HSAs for the bedrock well (MW-22D). Investigation locations are shown in **Figure 3-1**.

Surface soil samples (defined as soil samples from the first 2 inches of native soil or fill) were not collected as the entire site is located within an asphalt paved area.

Surface asphalt, was cut and removed; then, all borings were continuously sampled to drilling refusal. Direct-push samples were collected using a 4-foot long, acetate-lined Macrocore sampler.

Upon recovery, each soil sample was inspected for evidence of contamination (e.g., staining, odors, etc.) and screened for VOCs using a MiniRae 3000 photoionization detector (PID). The AECOM geologist classified the soils in accordance with the Unified Soil Classification System (USCS). Drilling observations were recorded on boring logs presented in **Appendix D**.

One to two soil samples were retained from each boring for laboratory analysis (see **Table 3-1).** One sample was collected from the interval exhibiting greatest indication of contamination (e.g., elevated PID reading, odor, staining) above the water table. If no visible sign of contamination were present above the water table, the interval just above the water table was sampled. A second subsurface soil sample was collected for VOC-only analysis from the saturated zone if observations (elevated PID readings, odor, or staining) indicated potentially greater VOC impacts in the soil below the water table. If both historical fill material and native material were present in a soil boring, a sample from each type of material was collected.

One boring, for well location MW-22D, was advanced into bedrock. The MW-22D well boring was advanced approximately 11.3 feet into bedrock using an HQ core barrel.

3.4.2 Well Installation

Monitoring well MW-13S was completed as a shallow (i.e., overburden) well on September 24, 2020. Well MW-13S was constructed from the top of bedrock using a 2-inch ID polyvinyl chloride well casing and 5-foot long 0.010-inch slot well screen. The annular space was filled with Filpro® US Silica WG#0 sand from the well bottom to a depth of approximately 2 foot above the screen and riser coupling. A hydrated bentonite seal was placed above the sand pack to approximately 1 foot bgs. The well was finished with a flush-mount well box set in concrete to a depth of one-foot bgs.

Monitoring well MW-22D was completed as a deep (i.e., bedrock) well from September 22, 2020 to September 24, 2020. The MW-22D well boring was initially advanced through the overburden to the top of rock at 13.2 ft bgs. The well boring was then advanced approximately 2.3 feet into bedrock (to a depth of approximately 15.5 feet bgs) using HSAs. A 4-inch diameter steel separation casing was then grouted in place. After the grout was allowed to cure for approximately 48 hours, the boring was advanced to a depth of 24.5 feet bgs using an HQ core barrel (approximately 3-3/8 inch outside diameter). Terminal depth was achieved based on successful location of one to two smooth undulating open water bearing fractures, identified in prior investigations as being continuous in several other wells at and downgradient of the BCP Site. Drilling water loss was encountered in the area of these fractures. Following coring to 24.5 feet bgs, the well was completed as an open borehole well (15.5 to 24.5 feet bgs). The well was finished with a flush-mount well box set in concrete to a depth of 1 foot bgs. Well construction logs are provided within the boring logs in **Appendix D**. **Table 2-1** presents a summary of well construction information.

3.4.3 Well Development

On September 28, 2020, the two new monitoring wells MW-13S and MW-22D were developed using a foot valve and surge block attached to disposable high-density polyethylene (HDPE) tubing operated by a Waterra hydrolift pump. Water quality measurements of pH, specific conductivity, temperature, and turbidity were measured periodically during the well development process. The turbidity remained very high (i.e., >1,000 Nephelometric Turbidity Units [NTUs]) in MW-13S throughout the well development process. The target turbidly of less than 50 NTU was achieved at well MW-22D. Well development purge water was stored in 55 gallons drums pending IDW disposal. Details of each well development are provided in the well development logs located in **Appendix E**.

3.4.4 Hydraulic Conductivity Testing

Hydraulic conductivity (slug) tests were not performed on either of the new well locations as there were previous studies performed during historical investigations at the site. Hydraulic conductivity testing results from previous historical investigations at the site are provided in **Appendix F**.

3.5 Groundwater Level Measurement

A round of groundwater levels from all existing wells on the current BCP Site and former VCP site were collected on September 8-9, 2020 and at the two new well locations (MW-13S, and MW-22D) on October 2, 2020. At each well, the water level was measured using an electronic water level meter and recorded to the nearest 0.01 foot. Prior to taking the water level measurements, field staff used a QRAE II 4-gas meter and MiniRAE 300 PID equipped with an 11.7 eV lamp to collect headspace readings at each well and noted the general condition of each well. Each well that previously exhibited elevated methane and/or hydrogen sulfide levels had a vented cap previously installed. The round of water levels for this RI is presented in **Table 3-3**; review of groundwater elevations is presented in Section 4. The well condition observations and headspace readings are presented in **Table 3-4**.

3.6 Monitoring Well Groundwater Sampling

Groundwater Sampling was performed in accordance with the RIWP. Groundwater sampling was separated into two different categories for the RI. To address the objective to evaluate data gaps at the site required under the BCP for contaminants (VOCs, SVOCs, metals, PCBs, pesticides and emerging contaminants 1,4-dioxane and PFAS) twelve sampling locations were chosen within the BCP Site boundary, including the two newly installed wells. To address the objective of collecting groundwater samples within the current BCP Site footprint and the former VCP site monitoring well network to evaluate the current status of the VCP-defined VOC plume and the ongoing effectiveness of VCP remedial actions, an additional 31 monitoring wells (20 within and 11 outside BCP Site footprint) were analyzed for the same parameters as the previous VCP Site SMP Fall Semi-Annual monitoring list. Select monitoring wells were sampled for microbial CENSUS analyses (DHC and DHC functional genes) for monitored natural attenuation (MNA) parameters. Refer to **Tables 3-1 and 3-2; and, Figure3-2** for a well by well list of analyses.

Copies of groundwater sample collection logs are provided in **Appendix G.**

3.6.1 BCP Groundwater Locations

Groundwater samples were collected at 12 BCP on-Site sample locations between September 9, 2020, and October 2, 2020 (**see Figure 3-2**). Groundwater samples were collected using a peristaltic pump and dedicated (per location) disposable HDPE tubing. Prior to starting each location, except for the two new well locations, previously installed location-dedicated low-density polyethylene (LDPE) tubing was removed from each BCP sampling location and the HDPE dedicated tubing was installed to comply with necessary PFAS sampling protocols. During the purging process, the water quality parameters pH, temperature, specific conductivity, dissolved oxygen (DO), turbidity, and ORP were measured utilizing a flow-through cell. Well purging continued until these water quality parameters stabilized within specific tolerances for at least three consecutive readings. Additionally, BCP monitoring wells were purged a minimum of three well volumes prior to sample collection and low-flow sampling. If the well went dry due to insufficient recharge, a grab sample was collected after the well had time to recharge. During sample collection, the flow-through cell was disconnected, and the sample tubing discharge was directed into the laboratory supplied sample containers. PFAS samples were collected prior to any other analyses and segregated into their own cooler. Field testing analyses (HACH®) kits for alkalinity, carbon dioxide, hydrogen sulfide, and ferrous iron were collected immediately following sampling at a well location. Groundwater samples were submitted for laboratory analysis for TCL VOCs, TCL SVOCs, PCBs, pesticides, TAL metals, and 1,4-dioxane and PFAS. Groundwater samples from these wells were also submitted for reductive dechlorination laboratory analyses (methane, ethane, ethene, dissolved iron, dissolved potassium, total organic carbon, sulfate, and sulfide). Groundwater samples from three of these 12 wells were also submitted for microbial analyses (DHC and DHC functional genes).

3.6.2 Groundwater Plume Monitoring Locations

In addition to the 12 BCP Site groundwater samples, an additional 31 groundwater samples were collected from monitoring wells located within (20) and outside (11) the BCP Site footprint to replicate the VCP SMP fall semi-annual sampling list of monitoring locations. The plume monitoring samples were collected between September 9, 2020, and September 18, 2020 (**Figure 3-2**). Groundwater samples were collected using a peristaltic pump and pre-existing dedicated (per location) LDPE tubing. During the purging process, the water quality parameters pH, temperature, specific conductivity, DO, turbidity, and ORP were measured utilizing a flow-through cell. Well purging continued until these water quality parameters stabilized within specific tolerances for at least three consecutive readings. If the well went dry due to insufficient recharge, a grab sample was collected after the well has had time to recharge. During sample collection, the flow-through cell was disconnected, and the sample tubing discharge was directed into the laboratory supplied sample containers. Field testing analyses (HACH®) kits for alkalinity, carbon dioxide, hydrogen sulfide, and ferrous iron were collected immediately following sampling at a well location. Groundwater samples were submitted for laboratory analysis for VOCs, reductive dechlorination analyses (methane ethane, ethene, dissolved iron, dissolved potassium, total organic carbon, sulfate, and sulfide), and microbial population analyses (select wells).

3.7 Surface Water and Sediment Sampling

There were no surface water or sediment samples collected as part of the RI, as there are no open surface water bodies at the Site or the surrounding property.

3.8 Vapor Intrusion Sampling

Previous, historical soil vapor screening data exists for VOCs/SVOCs and there is an active SVI mitigation system installed in 2010, currently operating in the main office building downgradient of the Site boundary. Historical Soil Vapor results are presented in **Figure 2-11**. Since the site has transitioned from the VCP to the BCP, AECOM has continued to perform quarterly OM&M inspections of the SSD system in accordance with the Ekonol SSD System OM&M Plan dated December 5, 2011 (Parsons, 2011) which was NYSDEC-approved under the VCP. The quarterly inspection checklists for 2020/2021 are included as **Appendix H.** No repairs or maintenance to the SSD system were needed in 2020/2021.

Additional soil vapor intrusion data samples, including one indoor air (with duplicate) and one outdoor air, were collected as part of this RI on April 22, 2021 in response to the October 5, 2020 letter from NYSDOH and in accordance with the letter work plan for the SVI assessment submitted to NYSDEC on March 11, 2021. Installation and collection of associated SVI assessment samples was conducted in accordance with the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH, October 2006).

At each location, sample collection was performed using a 6.0-liter stainless steel, laboratory-provided Summa® canister equipped with an 8-hour regulator. Samples were submitted for standard 10-day turn-around time for analytical samples. The NYSDEC Structure Sampling Questionnaire and Building Inventory form was completed and is provided in **Appendix H**. The field scientist recorded the sample identification, canister and regulator identification, date and time of sample collection, sample location and height, and the sampling method and device. In addition, the purge volume, sample volume, pre- and post-sampling canister vacuum pressure, and sampler name were recorded. These items are included within the NYSDEC Structure Sampling Questionnaire and Building Inventory and chain-of-custody form (**Appendix H**).

The SVI samples were analyzed for VOCs including those listed in NYSDOH Soil Vapor/Indoor Air Decision Matrix A, B and C using EPA Method TO-15. Reporting limits met the NYSDOH requirements of

0.2 micrograms per cubic meter (µg/m^3) for TCE, cis-1,2-DCE, 1,1-dichloroethene, vinyl chloride and carbon tetrachloride and 1 µg/m^3 for all other VOCs (except alcohols and ketones).

3.9 Surveying

The new boring and monitoring well investigation points were surveyed for location and elevation by a NY State Licensed Land Surveyor. The survey coordinates were geo-referenced to North American Datum (NAD) 1983 New York State Plane Coordinates and National Geodetic Vertical Datum (NGVD) 1988 Datum. Measurements were recorded to within 0.01 foot. The survey data were placed in the project database and used to generate the Site figures presented in this report.

3.10 Sample Analyses

Subsurface soil and groundwater samples collected during RI field activities completed September-October 2020 were delivered under proper chain-of-custody to Eurofins TestAmerica in Canton, Ohio, an NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory for the requested analyses. Microbial CENSUS analyses for the plume status monitoring MNA were delivered to Microbial Insights, Inc., Knoxville, Tennessee.

April 2021 air samples were delivered to Eurofins TestAmerica Laboratories, South Burlington, Vermont, an NYSDOH ELAP certified laboratory for the requested analyses.

Laboratory analytical parameters and methods are shown in **Table 3-5**. Following acceptance into the BCP, the RI laboratory analyses included VOCs, SVOCs, PCBs, pesticides, TAL metals, and 1,4-dioxane and PFAS. The plume monitoring MNA laboratory analyses included VOCs and reductive dechlorination laboratory analyses (methane, ethane, ethene, dissolved iron, dissolved potassium, total organic carbon, sulfate, and sulfide). The microbial laboratory analyses included DHC and DHC functional genes. Field testing analyses included alkalinity, carbon dioxide, hydrogen sulfide, and ferrous iron collected at select locations using HACH® kits. Air samples included VOCs using EPA Method TO-15.

3.11 Decontamination Procedures

A temporary decontamination pad was constructed to the west of the BCP site boundary. Equipment used for borehole clearing and sampling (e.g., post hole diggers and Macrocore samplers) were decontaminated with a non-phosphate detergent (Alconox) and potable water solution followed by a potable water rinse. Down-hole drilling equipment (e.g., HSAs and drilling rods) were initially cleaned of soil and then cleaned with high-pressure steam between locations.

For groundwater sampling and well development, dedicated equipment and sampling tubing was used where possible. Small equipment was decontaminated with Alconox and laboratory-provided PFAS free-water in HDPE spray bottles.

3.11.1 Investigation-Derived Waste Characterization and Disposal

IDW, including decontamination water, purge water, soil cuttings, disposable sampling materials, and personal protective equipment, was segregated and stored in DOT approved 55-gallon steel drums. Purge water from monitoring wells historically below hazardous waste disposal criteria was segregated and staged separately from purge water from wells historically greater than hazardous waste disposal criteria. Drums containing potentially hazardous soil and purge water were labeled and stored in accordance with the Site’s hazardous waste management plan. Soil and wastewater was characterized for proper disposal based on laboratory analyses and assigned either a hazardous or non-hazardous designation. All IDW drums that were temporarily staged at the Site have been removed and properly disposed of; hazardous waste manifests and non-hazardous bills of lading have been received by AECOM from the appropriately licensed waste disposal facilities and are maintained in the project file.

3.11.2 Site Engineering Controls and Pavement Inspection

The VCP SMP required periodic inspection of the pavement cover over the bioreactor trenches. As part of the September-October 2020 RI, the pavement surface conditions above the bioreactor trenches were inspected for settlement and groundwater monitoring well protective casings were inspected for integrity. A site-wide inspection was completed on October 6, 2020. The pavement inspection form and site-wide inspection form are included in **Appendix H**. As noted in the Pavement Inspection Form, asphalt patch is recommended for a few pitted areas of pavement over the bioreactor trenches. These repairs are nominal in nature and are pending appropriate weather for use of "cold patch" asphalt patching. AECOM will continue to monitor conditions identified in the inspection forms.

In addition, during the round of water levels on September 8-9, 2020, well headspace concentrations were monitored for methane (lower explosive limit, or "LEL") and hydrogen sulfide vapor concentrations. Locations that exhibited elevated levels of methane and/or hydrogen sulfide (within the well casings) were documented and are presented in **Table 3-4**. In September 2020, each well that exhibited elevated methane and/or hydrogen sulfide levels had a vented cap previously installed.

4. PHYSICAL SITE CHARACTERISTICS

Information obtained during the previous investigations performed at the Site pertaining to topography, geology, and hydrogeology is summarized in the following sections.

The Site consists of approximately 1.006 acres. The Ekonol Polyesters Resins Building lies immediately north of the BCP Site boundary. Large asphalt driving and parking areas are located to the south, east and west of the manufacturing building. Peripheral areas of the Site are additional parking and manufacturing buildings utilized by the site leaseholder, Saint-Gobain Ceramics and Plastic, Inc. and act as a buffer zone to neighboring residential and commercial properties.

It is known from previous VCP investigations at the property that the VOC plume in bedrock extends beyond the 1.006 acre BCP Site boundary, extending to monitoring wells to the south and east of the BCP Site boundary within the Saint-Gobain parking lot area and at a few monitoring wells near the southern property line for 6600 Walmore Road.

Water at the Site is provided by the Town of Wheatfield, which the town purchases from the Niagara County Water District. The County sources the water from the western side of the Niagara River. AECOM personnel called the Town of Wheatfield Water and Sewer Department on August 20, 2019 and confirmed that all Wheatfield residents are on publicly supplied water, provided by Niagara County.

4.1 Site Topography and Drainage

The Site is in the Erie-Ontario Lowlands Physiographic Province. The U.S. Department of Agriculture's Soil Conservation Service (USDA, 2019) identified the surface soils in the area of the Site as Odessa silty clay loam, 0 to 3 percent slopes. In general, this material consists of red clayey glaciolacustrine deposits derived from calcareous shale.

Topography at the Site is relatively flat and located at an approximate elevation of 600 feet AMSL. Asphalt pavement covers the entire 1.006 acre BCP Site with surface water drainage directed to storm water catch basins.

The predominant surface water feature in the area is the Niagara River, located approximately three miles south of the facility. Bergholtz Creek, a tributary of the Niagara River, is located approximately 0.5 miles south of the Site.

4.2 Site Geology

Overburden at the site consists of a thin layer of imported fill overlying natural deposits of upper lacustrine silty red-brown clay, laminated with thin gray silty clay lenses, grading into a red-brown silt and clay. Fine to coarse sand and fine to coarse gravel was found at the interface of the bedrock surface. The Site is underlain by approximately 12-14 feet of unconsolidated materials overlying bedrock. Previous investigative areas downgradient of the BCP boundary described unconsolidated material up to 18.7 feet bgs.

The bedrock in the area of the site is Middle Silurian Lockport Dolostone, which consists mainly of light to dark gray, fine- to coarse-grained dolostone. The uppermost member of the Lockport, the Guelph Dolostone is the uppermost bedrock formation at the Ekonol Site, is roughly 10-20 feet thick, is a water bearing zone, and overlies the upper part of the Eramosa Formation member of the Lockport group which is primarily massive and relatively unfractured. The top part of the upper Eramosa was only penetrated during drilling the deepest VCP site wells. Poorly preserved fossils, stylolites, carbonaceous partings, vugs, gypsum seams, metal sulfides, and stromatolites are observed in the Lockport. The Lockport group has a generally east-west strike, and dips to the south at approximately 25 feet per mile. This formation contains weathered bedding planes and fracture zones amid relatively competent rock. Fractures consist predominantly of horizontal bedding plane fractures with minor near vertical jointing. A fracture zone was encountered during drilling at the site at depths ranging from 20.25 to 29.70 feet bgs.

4.3 Site Hydrogeology

The surface of the Site is almost entirely covered by asphalt and/or pavement, with additional nearby buildings up and downgradient of the Site. Precipitation that falls is directed to storm sewer catch basins down gradient or temporarily ponds on the pavement and slowly disappears by either evaporation and\or downward percolation through cracks in the surface material and into the overburden.

Overburden groundwater during the September-October 2020 RI occurred between 2.5 to approximately 8 feet bgs. Overburden groundwater elevations ranged from 576.94 ft AMSL (MW-13S) to 583.16 ft AMSL (PMW-1S) with a very shallow gradient to the south-southeast. The presence of buildings and pavement limits vertical recharge to the overburden at the Site

Bedrock groundwater is semi-confined. Regional bedrock groundwater flow is to the south-southwest towards Bergholtz Creek with depth to groundwater during the RI investigation occurring between 4.5 to 12 feet bgs. Bedrock groundwater elevations ranged from 574.28 ft AMSL (MW-16D) to 580.85 ft AMSL (PMW-8D) with an overall flow to the southwest. In the bedrock water-bearing zone, the gradients are low, and groundwater flow is dependent on travel through interconnecting fractures. Variations in fracture size and direction could result in variations in preferential flow directions at the Site.

Water level measurements recorded during the September-October 2020 RI groundwater sampling event are presented in **Table 3-3**. Using the measurements in **Table 3-3**, **Figures 4-1** (Overburden) and **4-2** (Bedrock) present the groundwater elevation contour maps.

4.3.1 Aquifer Properties Testing Historical Data Review

Packer testing and downhole investigations took place for select wells during previous Phase II and Phase III site investigations and transmissivity was calculated at 5.6 x 10^1 ft^2/day to 1.17 x 10^3 ft^2/day during pulse interference testing in the RAR investigations (Parsons, 2003; 2004a, 2004b, 2007). The results of these previous studies are used to evaluate the current status and potential migration of contaminants of concern at the site. The tests completed at the Site are summarized in the following paragraphs.

Aquifer tests in the form of packer testing, pulse interference tests, and downhole observations was performed during previous site investigations. The packer tests were used to determine various hydrogeologic parameters (aquifer characteristics) such as permeability. The aquifer parameters from packer testing were determined in the Phase II, Phase III, and Phase III Supplemental Reports (Parsons, 2003; Parsons, 2004a; Parsons, 2004b). Packer testing was performed at historical well locations MW-10D, MW-11D, MW-13D, MW-14D, MW-15D, MW-16D, MW-17D, and MW-18D at multiple depth intervals while the wells were drilled. The packer testing results are included in **Appendix F**.

A series of nine pulse interference tests were conducted for overburden and six for bedrock and are presented in the RAR (Parsons, 2007). These tests evaluated hydraulic conductivity and the connectivity of the fracture system between boreholes for the overburden and bedrock water-bearing zones. The methods of the tests from the RAR are included in **Appendix F**. The results and well locations used during the test are presented in Table 3, and Figures 5 and 6 from the RAR (Parsons, 2007) which are also reproduced in **Appendix F.**

Further testing occurred during the second phase of the Remedial Alternatives evaluation in October 2006 and during the pilot test well installations in November-December 2007. Fracture observations included examination of rock core as well as using a downhole camera to photograph fractures, and a downhole caliper to identify the number and size of fractures in the injection boreholes. A downhole geophysical and televiewer logging survey report, for wells MW-7D and MW-21D was produced for the second phase of the RAR is presented in **Appendix F**.

During the pilot testing, groundwater hydraulics were characterized through fracture observations and down hole measurements, water level measurements and drawdown tests during drilling and well development (Parsons, 2009a). Fractures in the pilot test area were noted near the top of rock, with 1 or 2 tight fractures at approximately 12 to 14 feet bgs, and at approximately 22 to 24 feet bgs, where 1 to 2 smooth undulating open water bearing fractures were noted. Observations indicated that the upper fracture was not continuous, but that the lower fracture was continuous through the pilot test area. The lower fracture was also more permeable. The camera and drill core observations were interpreted and indicated that the fractures at the site showcased block and cavity characteristics where there is an open cavity bounded above and below by blocks of bedrock, with the blocks acting as rock fragments partially connected to the massive rock; but separated from the intact bedrock by smaller fractures. Per the Pilot Test Report (Parsons, 2009a), the block and cavity characteristic was hypothesized to cause higher fraction-distortions and twists and larger volumes of dead-ended pore space compared to a smooth, flat fracture. Drawdown observations during the pilot test well development were also noted. Figure 3-1 and Figure 3-2 from the Pilot Test Report show a typical rock core from the Site and a conceptual drawing of the block and cavity character. These figures and the photos, caliper measurements and development logs from the pilot test report are reproduced in **Appendix F**.

A fluid replacement test and a slug test were also done at MW-12S. An increase in specific conductivity observed at the bottom of the well during the well fluid replacement test indicated that the groundwater enters the well near the bottom of the screen. The slug test indicated low, non-uniform flow rather than uniformly over the screened interval of the well (Parsons, 2009b). The graphed results from the slug test and well fluid replacement test are attached in **Appendix F**.

During the 2020 RI, one location (MW-22D) was cored to 24.5 ft bgs using an HQ core barrel. The boring logs described similar fractures to those noted during the pilot test described above. The rock coring description from the boring log at MW-22D notes a tight fracture followed by a slightly open fracture around 17 ft bgs, an open fracture at 23 ft bgs, and a fracture zone with water loss from 23.2-23.6 This is consistent with the previous knowledge of fractures at the site.

5. NATURE AND EXTENT OF CONTAMINATION

5.1 Analytical Data

Upon receipt from the laboratory, the analytical results were validated by an AECOM chemist in accordance with NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation and USEPA Region II data validation procedures. Copies of the Data Usability Summary Reports are provided in **Appendix I**. Copies of the laboratory analytical reports are contained in **Appendix J**. The validated analytical and field results are summarized in **Tables 5-1** through **5-7** and exceedances of the relevant criteria are shown on **Figures 5-1** through **5-4**. The data are compared to applicable Standards, Criteria, and Guidance (SCG) values as noted below.

Soil Criteria

The soil analytical results are compared to Unrestricted Use, Protection of Groundwater, and Industrial Use Soil Cleanup Objectives (SCOs) presented in Title 6 New York Codes, Rules, and Regulations (NYCRR) Chapter IV Part 375 (NYSDEC, 2006). The criteria include parameters present in NYSDEC's CP-51 Soil Cleanup Guidance. The emergent contaminant 1,4-dioxane has criteria as listed in Part 375.

The emergent contaminants PFAS have been compared to guidance values from *Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs,* NYSDEC, January 2021.

Groundwater Criteria

The groundwater analytical results are compared to NYSDEC Technical & Operational Guidance Series 1.1.1, Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, June 1998, including January 1999 Errata Sheet, April 2000 and June 2004 Addenda (TOGS) for Class GA (NYSDEC, 1998).

The emergent contaminants PFAS were compared to drinking water standards presented in *Analysis, and Assessment of PFAS under NYSDEC's Part 375 Remedial Programs, January, 2021*. The emergent contaminant 1,4-dioxane was compared to drinking water standards presented in *Public Water Systems and NYS Drinking Water Standards for PFOA, PFOS, and 1,4-Dioxane*, NYSDOH, Center for Environmental Health, September 2020.

SVI Criteria

The SVI analytical results are compared to Air Guideline Values Derived by NYSDOH (NYSDOH, October 2006, Updated September 2013, and August 2015).

5.2 BCP Soil Analytical Results

As noted above, the BCP Site is covered with asphalt pavement so no surface soil samples were collected. Subsurface soil samples collected to address data gaps for the BCP during the RI investigation were analyzed for VOCs, SVOCs, metals, PCBs, pesticides, and emerging contaminants 1,4-dioxane and PFAS.

The subsurface soil analytical results are presented in **Tables 5-1** and **5-2**.

5.2.1 RI Subsurface Soil Analytical Results

Between September 21 and 24, 2020, a total of 13 subsurface soil and one duplicate subsurface soil samples at nine separate locations were collected. One location (SB2020-03) had two samples collected for all soil parameters, one from above the presumed water table and one at the bottom of the boring on top of rock based on elevated PID readings. Three other locations (SB2020-05, SB-2020-07, and SB2020-08) also had a second sample collected above bedrock for VOCs only.

VOC Subsurface Soil Analytical Results

Four VOCs were detected at a concentration above the Unrestricted Use SCO or Protection of Groundwater SCO in at least one sample. TCE was detected at a concentration above the Unrestricted Use and Protection of Groundwater SCOs in one location (SB2020-02). Cis-1,2-DCE was detected at a concentration above the Unrestricted Use and Protection of Groundwater SCOs in eight samples plus the duplicate at five locations (SB2020-02, SB2020-03, SB2020-04, SB2020-05, and SB2020-08). VC was detected at a concentration above the Unrestricted Use and Protection of Groundwater SCOs in one location (SB2020-04). Methyl ethyl ketone (MEK) was detected at a concentration above the Unrestricted Use and Protection of Groundwater SCOs in six samples at four locations (SB2020-03, SB2020-04, SB2020-05, and SB2020-08). Acetone was detected at a concentration equal to but not exceeding the Unrestricted Use and Protection of Groundwater SCOs in one location in the bedrock interface sample in SB2020-07.

All VOCs in subsurface soil collected during the 2020 RI were below the respective Industrial Use SCO.

SVOC Subsurface Soil Analytical Results

None of the 13 subsurface soil samples had SVOCs that were detected above the relevant SCOs. Four SVOCs in soil were detected at concentrations below the Unrestricted Use SCO (1,1-biphenyl at two locations; acetophenone at one location and the duplicate; chrysene at five locations and fluorene at one location).

PCB Subsurface Soil Analytical Results

None of the 13 subsurface soil samples had PCBs that were detected above the relevant SCOs. One PCB (Aroclor 1254) was detected at an estimated concentration of 43 micrograms per kilogram (µg/kg) in one subsurface soil sample (SB2020-03) but did not exceed the Unrestricted Use SCO (100 µg/kg).

Pesticide Subsurface Soil Analytical Results

None of the 13 subsurface soil samples had pesticides that were detected above the relevant SCOs. One pesticide (beta-BHC) was detected at estimated concentrations at two sample locations (SB2020-02 [6.8 µg/kg] and SB2020-07 [10 µg/kg]) but did not exceed the Unrestricted Use SCO (36 µg/kg).

Metals Subsurface Soil Analytical Results

Ten subsurface soil samples plus one duplicate were collected for metals analysis from nine RI boring locations. Metals detected above Unrestricted Use SCOs in each sample included aluminum, calcium, and iron; there are no Protection of Groundwater or Industrial Use SCOs for these metals. Nickel was detected above the Unrestricted Use SCO but below Protection of Groundwater and Industrial Use SCOs in eight of 10 samples. No metals were detected at concentrations exceeding SCOs in any other sample.

1,4-Dioxane Subsurface Soil Analytical Results

The emerging contaminant 1,4-dioxane was detected in soil in ten subsurface soil samples plus the one duplicate from the nine locations. None of the detections were in exceedance of the relevant Part 375 SCOs.

PFAS Subsurface Soil Analytical Results

The emerging contaminants PFAS were not detected in any of the 10 subsurface soil samples or the duplicate from the nine locations sampled.

5.3 RI Groundwater Analytical Results

Groundwater samples for the 2020 RI were collected between September 9, 2020 and October 2, 2020.Groundwater samples were collected from two different analyses groups: BCP Site monitoring locations and groundwater plume status monitoring locations.

BCP Monitoring - Twelve monitoring wells within the BCP Site were analyzed for TCL VOCs, TCL SVOCs, PCBs, pesticides, TAL metals (total and dissolved), and the emerging contaminants 1,4-dioxane, and PFAS. Each well was also sampled for MNA parameters (dissolved iron, dissolved potassium, methane, ethane, and ethene (MEE), TOC, sulfate, sulfide); three of these wells were also sampled for microbial CENSUS analyses (DHC) and DHC functional genes. Field testing analyses (HACH®) kits for alkalinity, carbon dioxide, hydrogen sulfide, and ferrous iron were collected immediately following collection of laboratory samples at each of the 12 locations.

Plume Status Monitoring – An additional 31 monitoring wells located within (20) and outside (11) the BCP Site footprint were sampled for VCP-defined plume status monitoring which included a Site-specific subset of VOCs and MNA parameters (dissolved iron, dissolved potassium, MEE, TOC, sulfate, sulfide.). Field testing analyses (HACH®) kits for alkalinity, carbon dioxide, hydrogen sulfide, and ferrous iron were collected immediately following collection of laboratory samples at each of the 31 locations. Nine locations were also selected for microbial CENSUS analyses (DHC) and DHC functional genes.

The groundwater analytical results are summarized in **Tables 5-3, 5-4, and 5-5** and **Figures 5-2 through 5-15**.

5.3.1 VOC Groundwater Analytical Results

TCL VOCs - BCP Site Monitoring

Between September 9 and 18, 2020, groundwater samples from 12 well locations for TCL VOCs + 10 tentatively identified compounds (TICs) were collected from wells located within the BCP Site.

Seven VOCs (all chlorinated) were detected at a concentration above TOGS 1.1.1 criteria in at least one sample. The VOCs found to be in excess of the relevant criteria (in parentheses) are summarized as follows and in **Table 5-3** and **Figures 5-3** (Overburden) **and 5-4** (Bedrock):

- TCE (5 micrograms per liter (µg/L)) – Detections in samples from nine locations ranged from 0.13 J to 7,300 µg/L; TCE was detected above criteria at four locations and the duplicate: MW-4S, INJ-8D, PMW-1D, and PMW-11D with Duplicate.
- Cis-1,2-DCE (5 µg/L) – Detections in samples from ten locations ranged from 2.0 to 180,000 µg/L. Cis-1,2-DCE was detected above criteria at nine locations and the duplicate: MW-4S, MW-10S, MW-13S, PMW-1S, INJ-8D, PMW-1D, PMW-11D with Duplicate, RMW-3D, and RMW-4D.
- Trans-1,2-DCE (5 µg/L) – Detections in samples from four locations ranged from 8.7 J to 28 J µg/L. Trans-1,2-DCE was detected above criteria at all four locations where it was detected: MW-4S, MW-13S, PMW-1S and INJ-8D,.
- 1,1-DCE (5 µg/L) - Detections in samples from three locations ranged from 66 J to 72 J µg/L. 1,1-DCE was detected above criteria at all three locations where it was detected: INJ-8D, PMW-11D with Duplicate, and RMW-3D.
- VC (2 µg/L)– Detections in samples from 11 locations ranged from 0.20 J to 12,000 µg/L. VC was detected above criteria at ten locations and the duplicate: MW-4S, MW-10S, MW-13S, PMW-1S, PMW-10S, INJ-8D, PMW-1D, PMW-11D with Duplicate, RMW-3D, and RMW-4D.
- 1,1,1-TCA (5 µg/L)– Detections in samples from four locations ranged from 4.8 to 3,800 µg/L. 1,1,1-TCA was detected above criteria at three locations and the duplicate: INJ-8D, PMW-11D with Duplicate, and RMW-3D.
- 1,1-DCA (5 µg/L)– Detections in samples from four locations ranged from 1.4 to 600 ug/L. 1,1-DCA was detected above criteria at three locations and the duplicate: INJ-8D, PMW-11D with Duplicate, and RMW-3D.

Several other individual contaminants were detected at one or more locations but were not in excess of the TOGS 1.1.1 criteria, including: 1,3 dichlorobenzene, benzene, chlorobenzene, isopropylbenzene (cumene), MEK, PCE, and xylene.

In general, the greater impacts were near the former underground tank and immediately southwest and downgradient of the former tank.

Plume Monitoring VOCs - Short List Chlorinated VOCs

Between September 9 and 18, 2020, groundwater samples for an additional 31 well locations were analyzed for the Ekonol Specific compound list of chlorinated VOCs and BTEX (see **Table 5-5**). The results from the 12 locations for BCP Monitoring section above will be used in conjunction with data from the 31 monitoring wells located within (20) and outside (11) the BCP Site footprint to draw conclusions regarding the overall state of the Ekonol Polyester Resins VOCs plume.

Inside BCP Site

At the 20 wells for plume monitoring inside the site boundary (not including the 12 BCP locations discussed above), nine VOCs were detected at a concentration above the NYSDEC TOGS 1.1.1 Class GA groundwater SCGs in at least one sample. The VOCs found to be in excess of the relevant TOGS 1.1.1 criteria (in parentheses) are summarized as follows and in **Table 5-5** and **Figures 5-3** (Overburden) and **5-4** (Bedrock):

- TCE (5 µg/L) – Detections in samples from 13 locations ranged from 0.5 J to 21,000 µg/L; TCE was detected above criteria at 11 locations: PMW-3S, INJ-7D, INJ-11D, INJ-13D, PMW-2D, PMW-6D, PMW-8D, PMW-9D, PMW-10D, PMW-16D, and RMW-2D.
- Cis-1,2-DCE (5 µg/L) – Detections in samples from 20 locations ranged from 0.46 J to 350,000 µg/L. Cis-1,2-DCE was detected above criteria at 18 locations: MW-2S, OR-6SM, OR-14SM, OR-18SM, PMW-3S, PMW-4S, PMW-6S, INJ-7D, INJ-11D, INJ-13D, PMW-2D, PMW-6D, PMW-8D, PMW-9D, PMW-10D, PMW-16D, PMW-17D, and RMW-2D.
- Trans-1,2-DCE (5 µg/L) – Detections in samples from 16 locations ranged from 0.86 J to 1,200 J µg/L. Trans-1,2-DCE was detected above criteria at 11 locations: MW-2S, PMW-3S, PMW-4S, PMW-6S, INJ-7D, PMW-6D, PMW-8D, PMW-10D, PMW-16D, PMW-17D, and RMW-2D.
- 1,1-DCE (5 µg/L) - Detections in samples from two locations ranged from 3.8 J to 420 J µg/L. 1,1-DCE was detected above criteria at one location: INJ-7D.
- VC (2 µg/L) – Detections in samples from all 20 locations ranged from 1.7 J to 32,000 µg/L. VC was detected above criteria at 18 locations: MW-2S, OR-4SM, OR-6SM, OR-10SM, OR-14SM, OR-18SM, PMW-3S, PMW-4S, PMW-6S, INJ-7D, INJ-11D, INJ-13D, PMW-2D, PMW-6D, PMW-8D, PMW-9D, PMW-10D, PMW-16D, PMW-17D, and RMW-2D.
- 1,1,1-TCA (5 µg/L) – Detections in samples from two locations ranged from 380 to 1,900 µg/L. 1,1,1-TCA was detected above criteria at the two locations where it was detected: PMW-16D and PMW-17D.
- 1,1-DCA (5 µg/L) – Detections in samples from eight locations ranged from 0.30 J to 440 J ug/L. 1,1-DCA was detected above criteria at three locations: PMW-10D, PMW-16D, and PMW-17D.
- Benzene (1 µg/L) – Detections in samples from four locations ranged from 1.1 to 2.5 ug/L. Benzene was detected above criteria at all four locations where it was detected: OR-4SM, OR-6SM, OR-10SM, and OR-14SM.
- Xylenes, Total (5 µg/L) – Detections in samples from four locations ranged from 1.4 to 600 ug/L. Xylene was detected above criteria at two locations: OR-4SM and OR-6SM.

Other individual contaminants were detected at one or more locations but were not in excess of the TOGS 1.1.1 criteria, including: PCE, chloroethane, ethylbenzene, naphthalene, and toluene.

Outside BCP Site

Six VOCs (all chlorinated) were detected at a concentration above TOGS 1.1.1 criteria in at least one sample. The VOCs found to be in excess of the relevant criteria (in parentheses) are summarized as follows and in **Table 5-5** and **Figures 5-3** (Overburden) and **5-4** (Bedrock):

- TCE (5 µg/L) – Detections in samples from eight locations ranged from 1.2 J to 1,100 µg/L; TCE was detected above criteria at four locations and two duplicates: MW-11S, MW-12S with duplicate, MW-7D with duplicate, and MW-13D.
- Cis-1,2-DCE (5 µg/L) – Detections in samples from all eleven locations ranged from 0.17 J to 5,700 µg/L. Cis-1,2-DCE was detected above criteria at ten locations and two duplicates: MW-11S, MW-12S with duplicate, MW-7D with duplicate, MW-11D, MW-13D, MW-15D, MW-17D, MW-19D, MW-20D and MW-21D.
- Trans-1,2-DCE (5 µg/L) – Detections in samples from ten locations ranged from 0.17 J to 50 µg/L. Trans-1,2-DCE was detected above criteria at two locations and two duplicates: MW-12S with duplicate and MW-7D with duplicate.
- VC (2 µg/L) – Detections in samples from ten locations ranged from 0.66 J to 3,100 µg/L. VC was detected above criteria at nine locations and two duplicates: MW-11S, MW-12S with duplicate, MW-7D with duplicate, MW-11D, MW-13D, MW-15D, MW-17D, MW-20D and MW-21D.
- 1,1,1-TCA (5 µg/L) – Detections in samples from six locations ranged from 15 J to 150 µg/L. 1,1,1-TCA was detected above criteria at all six locations where it was detected and one duplicate: MW-7D with duplicate, MW-11D, MW-15D, MW-17D, MW-20D and MW-21D.
- 1,1-DCA (5 µg/L) – Detections in samples from nine locations ranged from 1.9 J to 320 ug/L. 1,1-DCA was detected above criteria at eight locations and two duplicates: MW-11S, MW-12S with duplicate, MW-7D with duplicate, MW-11D, MW-13D, MW-15D, MW-17D, MW-20D and MW-21D.

VOCs Summary

Generally, VOCs in the overburden and bedrock detected and in exceedance of the relevant groundwater criteria are consistent with historical studies and monitoring at the Site. **Figures 5-5 through 5-12** present isocontour maps for the 2020 RI showing the overburden and bedrock plumes for the main CVOCs of concern (TCE, cis-1,2-DCE, VC, and total Ekonol Site-Specific list of CVOCs). **Figure 5-13** presents an isocontour map for 1,1,1-TCA in bedrock; there is no accompanying overburden figure for 1,1,1-TCA as there were no detections of 1,1,1-TCA in the overburden. Benzene and xylene were also detected in slight exceedance of the relevant criteria in Site overburden groundwater (four and two locations, respectively). These chemicals are noted in historical data from the VCP.

Analysis of these figures reveals little change over that past two years in overburden and bedrock plume size and concentrations at individual wells. Individual well trends and historical tables showing concentrations of chloroethenes through September-October 2020 are presented in **Appendix A.** Concentrations for full TCL VOC plus 10 TICs at the 12 selected locations within the BCP Site did not identify any unknown VOCs of concern.

5.3.2 SVOC Groundwater Analytical Results

Six SVOCs (phenolic compounds, benzo(b)fluoranthene, and diethylphthalate) were detected at a concentration above their respective TOGS 1.1.1 criteria in at least one sample. The SVOCs found to be in excess of the relevant criteria are summarized as follows and in **Table 5-3** and **Figure 5-2**:

- 1,1-Biphenyl (5 µg/L)– Detections in samples from six locations ranged from 2.2 to 63 µg/L. 1,1-Biphenyl was detected above criteria at five locations and one duplicate: PMW-1S, INJ-8D, PMW-1D, PMW-11D with Duplicate, and RMW-4D.
- 2-Methylphenol (o-cresol) (1 µg/L) – Detections in samples from three locations ranged from 38 to 2,200 µg/L. 2-Methylphenol (o-cresol) was detected above criteria at all three locations where it was detected: INJ-8D, PMW-1D, and RMW-4D.
- 3&4-Methylphenol (1 µg/L) – Detections in samples from three locations ranged from 18 to 91 µg/L. 3&4-Methylphenol was detected above criteria at all three locations where it was detected: INJ-8D, PMW-1D, and RMW-4D.

- Benzo(b)fluoranthene (0.002 µg/L) –. Benzo(b)fluoranthene was detected above criteria at one location: PMW-10S at 0.38 µg/L.
- Diethylphthalate (50 µg/L) –. Diethylphthalate was detected above criteria at one sample location: RMW-4D at 62 µg/L.
- Phenol (1 µg/L) – Detections in samples from four locations ranged from 1.3 to 6,000 µg/L. Phenol was detected above criteria at all four locations where it was detected and one duplicate: INJ-8D, PMW-1D, PMW-11D with Duplicate, and RMW-4D.

Select other SVOCs were detected at one or more locations but were not in excess of the TOGS 1.1.1 criteria, including: acetophenone, benzo(g,h,i)perylene, fluoranthene, fluorene, phenanthrene, and pyrene.

5.3.3 PCB Groundwater Analytical Results

One PCB (Aroclor 1254) was detected at an estimated concentration above criteria (0.09 µg/L) at one sample location (INJ-8D) at 0.46 J µg/L.

5.3.4 Pesticide Groundwater Analytical Results

One pesticide (Endosulfan I) was detected at one location (PMW-1S [0.1 µg/L]). There is no Class GA groundwater standard for Endosulfan I listed in TOGS 1.1.1.

5.3.5 Metals Groundwater Analytical Results

TAL metals (both total and dissolved) were collected at the 12 BCP Site Monitoring locations. Metals at concentrations exceeding the groundwater criteria were detected in samples from all 12 BCP Site Monitoring locations. Metals exceeding the groundwater criteria included antimony, iron, magnesium, manganese, and sodium. The metals found to be in excess of the relevant criteria are summarized in **Table 5-3** and **Figure 5-2**:

From 2008 through 2012, substrate, additives, and buffers were injected into the bedrock. Some elevated metals concentrations may be attributed to these injections as injectate included calcium carbonate, sodium bicarbonate (pH buffer), sodium lactate (ingredient of the emulsified vegetable oil), and sodium bromide (increase conductivity). Additionally, as part of the trench construction sand was installed as an iron source.

5.3.6 1,4-Dioxane Groundwater Analytical Results

Samples for the emerging contaminant 1,4-dioxane were collected at the 12 BCP Site Monitoring locations. Detections in samples from nine locations ranged from 0.54 to 31 µg/L. 1,4-dioxane was detected above criteria at seven locations: MW-3S, MW-4S, MW-13S PMW-10S, INJ-8D, PMW-1D, and RMW-4D. The 1,4-dioxane results are summarized in **Table 5-4** and **Figures 5-14** (Overburden) and **5-15** (Bedrock).

5.3.7 PFAS Groundwater Analytical Results

The emerging contaminants PFAS were collected at the 12 BCP Site Monitoring locations. At least one of eight different PFAS was detected in all 12 locations, the field duplicate, and a sample collected from the municipal water source used by the drill crew (drill water sample). None of the detections were over the relevant PFAS SCGs for water samples. The PFAS results are summarized in **Table 5-4.**

Perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) have water criteria of 10 nanograms per liter (ng/L). Detections of PFOS at eight sample locations and the drill water ranged from 0.9 to 6.9 J ng/L. Detections of PFOA at seven sample locations and the drill water ranged from 1.1 J to 8.5 J ng/L.

Other PFAS detected at one or more locations but not in excess of emergent contaminant criteria, included: perfluorobutanoic acid (PFBA), perfluorohexanoic acid (PFHxA), perfluoropentanoic acid (PFPeA), perfluoroheptanoic acid (PFHpA), 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2), and perfluorohexanesulfonic acid (PFHxS).

5.3.8 Natural Attenuation Analytical Results

Samples from the 43 plume status monitoring locations (12 BCP wells + 20 other plume onsite wells + 11 offsite wells) were analyzed for natural attenuation parameters according to the schedule in **Table 3-2**. Natural attenuation parameters that were analyzed by the laboratory included: MEE, dissolved iron and potassium, TOC, sulfate, and sulfide. Microbial CENSUS analyses DHC and DHC functional genes were collected from 12 locations that have historically received the same analyses. The laboratory results are presented in **Table 5-5,** the historical tables in **Appendix A,** and briefly discussed below.

- MEE – Methane, ethane, and ethene concentrations were generally within historical norms since sampling for MEE for most locations. Some locations exhibited high MEE relative to historical results (i.e., MW-3S, MW-4S, MW-15D, MW-17D, MW-20D).
- Dissolved iron– Detected dissolved iron ranged from 0.056 J to 3.6 mg/L. One sample was non-detect. All concentrations were within the historical range since well installation. Several “onsite” locations (i.e., OR-4SM, OR-6SM, OR-10SM, OR-14SM, PMW-3S, PMW-4S, PMW-6S) exhibited generally higher iron results immediately following 2011-2012 IRM activities with generally decreasing iron results since completion of IRM injections.
- Dissolved potassium – Dissolved potassium ranged from 2.3 to 21 mg/L. One sample was non detect. All concentrations were within the historical range.
- TOC concentrations ranged from 1.6 milligrams per liter (mg/l) (MW-22D) to 270 mg/l (RMW-2D). In general, TOC values were within the historical range since well installation. The bedrock has more wells with TOC >20 mg/L (14 locations) than the overburden (3 locations), which is more desirable as an indicator for reductive dechlorination in the anaerobic treatment zone. The same well locations that exhibited decreasing iron since the 2011-2012 IRM activities also exhibited generally decreasing TOC results since completion of IRM injections.
- Sulfate – Sulfate levels ranged from non-detect to 3,300 mg/L Only one location (PMW-17D) had sulfate concentrations less than 20 mg/L. Low sulfate is desirable but not required for anaerobic reductive dechlorination processes. All concentrations were within the historical range.
- Sulfide –Sulfide levels ranged from non-detect to 340 mg/L. Fourteen locations had sulfide concentrations greater than 20 mg/L. Higher levels of sulfide may indicate biodegradation is progressing. All concentrations were within the historical range.
- DHC and DHC functional genes – BVC was detected in the sampled locations except for well PMW-10S and ranged from 6.6 to 74,800 cells/milliliter (ml) when detected. DHBt concentrations were detected in 6 out of 12 samples and ranged from 671 to 32,200 cells/ml when detected. DHC was detected in all sample locations and ranged from 5.4 to 618,000 cells/mL. TCEr was non-detect in PMW-10S and ranged from 2.7 to 10,300 cells/ml when detected. VCr was detected in all sample locations and ranged from 3.4 to 76,000 cells/ml. All microbial analyses were within historical ranges.

5.3.9 Field Measurements

Field parameter measurements of pH, temperature, specific conductivity, DO, and ORP were recorded during well purging and groundwater sample collection. The measurements recorded for the 43 wells sampled during the September-October 2020 sampling are presented in **Table 5-6** and briefly discussed below.

Well Head Analyses

- Temperatures in wells ranged from 12.86 to 21.80 degrees Celsius. Temperatures vary due to timing of flow-through and could be biased high for lower producing wells.
- Specific conductivity values ranged from 1.060 to 11.351 milliSiemens per centimeter (mS/cm).
- DO – Four wells went dry during purging and during sampling, DO was recorded between 2.57 and 6.08 mg/L. DO levels in other locations ranged from 0.18 to 2.11 mg/L and were similar for overburden and bedrock and for wells within and outside of the BCP boundary.
- Final pH values were generally neutral, ranging from 6.39 to 8.58. Following completion of the fieldwork, field and daily calibration sheets were reviewed and it was determined that pH readings at 15 locations, all sampled using the same water quality meter, were anomalous and/or had a pH > 9. These locations are: INJ-13D, OR-10SM, MW-3S, MW-4S, MW-12S, MW-7D, PMW-2D, PMW-3S, PMW-4S, PMW-10D, PMW-16D, PMW-17D, and RMW-4D. The field results were rejected due to possible water quality pH meter malfunction, incorrect field calibration, or calibration solution failure. At 13 of these locations there was sample volume at the laboratory to run pH as a laboratory analysis. MW-12S pH was re-collected in the field using an in-situ water quality meter on September 28, 2020. MW-20D did not have enough sample to run a laboratory pH and was rejected. The laboratory verified result for these locations are in-line with historical norms for pH at these locations. The laboratory results for pH are included in the Groundwater Sampling Field Parameter Results, **Table 5-6**.
- ORP values ranged from -369.3 to 107.4 milliVolts (mV). ORP values in 39 of the 43 wells were less than zero. Low ORP values are desirable for anaerobic reductive dechlorination processes.
- Turbidity values ranged from 0.34 to >1000 NTUs.

Mobile Lab Analyses (HACH® kits)

MNA parameters analyzed in the field using HACH® kits included: alkalinity, carbon dioxide, hydrogen sulfide, and ferrous iron.

- Alkalinity – Alkalinities ranged from <385 to 1925 mg/L.
- Carbon Dioxide - Carbon dioxide concentrations ranged from 20 mg/L to 290 mg/L. Carbon dioxide is a by-product of both aerobic and anaerobic degradation. Elevated levels of carbon dioxide indicate microbial activity has been stimulated. During the 2020 RI sampling event between September 10, 2020, and September 13, 2020, the field staff were unable to get carbon dioxide results at most locations due to problems getting readable results with the titration solution for the carbon dioxide HACH kit (Model CA-23). New solution was obtained and used from September 14, 2020 through October 2, 2020. Locations with results were obtained prior to September 14, 2020 may be biased and were assigned a J value.
- Hydrogen Sulfide – Hydrogen sulfide results ranged from 0 to > 5 mg/L. Approximately half the wells sampled for plume monitoring exhibited hydrogen sulfide > 5 mg/L.
- Ferrous Iron – The ferrous iron range was 0.00 – 2.33 mg/L with nine of 43 locations having ferrous iron greater than 1 mg/L. Of these locations with higher ferrous iron six were overburden well locations and three were bedrock well locations. All but one location was within the BCP Site boundary.

5.4 Vapor Intrusion Sampling Analytical Results

Historical sample results are discussed in **Section 2.4.9** and presented on **Figure 2-11**.

During this RI, one indoor air (with duplicate) and one outdoor air sample were collected on April 21, 2021 for VOCs using EPA Method TO-15. Detections above the reporting limit are presented on **Table 5-7** and **Figure 5-16** for the sampling event. Indoor air sample ID-1 results on this figure present the higher detected value of ID-1 and the ID-1 duplicate sample. The full laboratory report is included in **Appendix J**. The air sampling results for this RI were also submitted to the NYSDEC in a standalone document entitled *Remedial Investigation – Soil Vapor Intrusion Assessment Letter Report,* dated August 6, 2021 (attached as **Appendix K**.)

Sample analytes and reporting limits are provided in the laboratory report (**Appendix J**). The April 2021 indoor air monitoring program is intended to monitor VOC concentrations in indoor air and to evaluate SSD system effectiveness. The results are compared to Air Guideline Values Derived by NYSDOH (NYSDOH, October 2006, Updated September 2013, and August 2015).

As presented on **Table 5-7** and **Figure 5-16**, several VOCs were detected above detection limits. None of the detected VOCs are listed on the Table 3.1 Air Guideline Values derived by NYSDOH except for TCE which was detected at 0.21 $\mu g/m^3$, below the guideline value of 2 $\mu g/m^3$ (August 2015 NYSDOH guideline update).

6. CONTAMINANT FATE AND TRANSPORT

This section describes fate and transport processes that may influence the behavior of the contaminants detected at the Site. The discussion emphasizes the processes that are essential in evaluating potential exposure of human and environmental receptors to the Site contaminants detected at concentrations above the SCGs. The following items are presented in this section:

1. General description of fate and transport processes occurring in soil, groundwater, and soil vapor/indoor air systems.
2. Identification and description of properties of contaminants detected above the SCGs in the various media at the Site.
3. Media-specific and contaminant-specific evaluation of potential fate and transport mechanisms occurring at the Site.

6.1 General Description of Fate and Transport Mechanisms

Contaminants identified at the Site during this BCP RI that exceeded SCGs are:

- Soil – Chlorinated VOCs (TCE, 1,2-DCE, VC), MEK, and metals (aluminum, calcium, iron, and nickel); and,
- Groundwater – Chlorinated VOCs (TCE, 1,2-DCE, 1,1-DCE, VC, 1,1,1-TCA, 1,1-DCA), benzene and xylene (in the southern bioreactor trench, only), phenol and phenolic compounds, one polycyclic aromatic hydrocarbon (PAH, benzo(b)fluoranthene in one well), one PCB (Aroclor 1254 in one well), metals (antimony, iron, magnesium, manganese, and sodium), and 1,4 dioxane.

The above identified contaminants are evaluated further below.

6.1.1 Transport Processes

Contaminant transport in the subsurface can occur as movement of dissolved contaminants in groundwater and/or as migration of volatilized contaminants in soil vapor. The primary transport mechanisms are mass partitioning, advection, and dispersion.

Mass partitioning is a process in which contaminants move between different environmental media in response to concentration gradients. For example, contaminants dissolved in groundwater may sorb (i.e., attach) onto soil particles or volatilize into the soil vapor. The process may involve mass transfer in any direction between any of the environmental media. The net result of mass partitioning is the distribution of the contaminant between all phases that remain in physical contact with each other. Typically, mass partitioning acts to inhibit the migration of contaminants in groundwater or soil vapor by immobilizing a part of the mass in the soil matrix (retardation). However, the process may be reversed, resulting in the release of the sorbed contamination into the groundwater or soil vapor.

In the unsaturated zone (i.e., between ground surface and the water table), the total mass of a contaminant is partitioned between the dissolved phase (soil moisture), the gas phase (soil vapor), and the solid phase (soil matrix). In the saturated zone, the soil vapor phase is absent, and the partitioning occurs only between the soil matrix and groundwater. Under equilibrium conditions, each phase contains a fraction of the total contaminant mass present in the system (i.e., total of all phases equals 100 percent of the contaminant mass present). The relative mass fractions are determined by the properties of each contaminant and by the nature of the soil matrix. Equilibrium conditions may be disturbed by phenomena such as migration of contaminated groundwater or soil vapor into an area, or removal of contaminant mass from one of the media through degradation processes or gravity flow. Under these circumstances, concentration gradients are created resulting in the occurrence of mass transfer between the media until equilibrium is re-established.

The contaminant mass sorbed onto the soil matrix is essentially immobile. The exception is the mass in the topmost soil layer near the ground surface, which can be transported by processes capable of moving soil particles (wind or surface water runoff). However, since soil within most of the Site area is not exposed due to covers such as pavement and concrete, this is not a significant transport pathway.

Transport of contaminants dissolved in the soil moisture in the unsaturated zone is generally limited as a result of very low flow rates in the absence of full saturation. The only significant mechanisms may be driven by water level fluctuations and gravity-driven downward flow during wet-weather periods, or possibly sewer lines and manholes/catch basins which may be leaking and/or act as preferential pathways. Such vertical transport of contaminants acts as a source for the saturated zone below.

The contaminant mass, especially VOCs, contained within the soil vapor in the unsaturated zone and within groundwater in the saturated zone is considered mobile. Soil vapor can migrate in both vertical and horizontal directions in response to pressure gradients. Soil vapor migration can create a discharge of contaminants into the atmosphere or building basements, or act as a source of contamination for groundwater in the saturated zone. Migrating soil vapor may transfer mass into the soil matrix and soil moisture in previously uncontaminated areas, thus increasing the areal extent of soil contamination in the unsaturated zone.

The primary transport mechanisms for contaminants dissolved in groundwater are advection and dispersion. Advection is the movement of the dissolved contaminants carried by the flow of groundwater. Dispersion refers to dissolved contaminants spreading due to the presence of non-uniformities of the groundwater flow field. Dispersion results in a general widening of a plume, as well in smearing of the plume boundaries. Processes similar to those that occur for soil vapor can enable dissolved contaminants to reach a previously uncontaminated area and enter other environmental media. Given the relatively moderate hydraulic gradient observed in the groundwater levels, dispersion and advection are transport mechanisms in groundwater at this Site.

Contamination migrating with soil vapor or groundwater constantly interacts with the soil matrix. The driving forces behind this process are created by concentration gradients between different phases and the properties of the contamination and the soil matrix. Contaminant mass may either sorb from the mobile soil vapor or groundwater onto the soil particles or it may undergo a reverse process of desorption.

In the case of sorption, contaminant mass is transferred from the mobile medium into the immobile soil medium. This retardation phenomenon tends to decrease the velocity of contaminant migration. The magnitude of the retardation depends on the properties of each contaminant and the soil matrix. The key indicator parameter for the retardation properties of the soil is the organic carbon content. Soils with high organic carbon content sorb dissolved contaminants more readily and create a more significant retardation effect than soil with limited, or no organic carbon content. Desorption is the reverse process. Contamination is transferred from the soil matrix into the groundwater or soil vapor. As a result, soil containing contaminant mass may act as a source if exposed to the less-contaminated soil vapor or groundwater. Desorption from soil into the soil vapor or groundwater is increasingly inhibited by increasing content of organic carbon in the soil.

6.1.2 Mass Destruction Processes

Abiotic mass destruction processes that rely on the presence of air or exposure to sunlight (such as hydrolysis and photolysis) have little impact within the subsurface and will not be discussed further.

The most significant mass destruction process that takes place in the subsurface environment is microbial degradation. The most significant microbial degradation processes for organic contaminants that operate in the subsurface are biological oxidation (aerobic and anaerobic); reductive dechlorination; and cometabolic degradation. During degradation, organic compounds are transformed into daughter forms, which may be recalcitrant or further degradable. Daughter compounds can be either more or less toxic than the parent compounds. If a contaminant degrades into a sequence of degradable daughter compounds, it is ultimately fully metabolized into such compounds as carbon dioxide, methane, water, and chloride. In general, reductive dechlorination occurs by sequential dechlorination from PCE to TCE to DCE to VC to ethene. Complete mineralization of VC leads to carbon dioxide and water. Depending upon environmental conditions, this sequence may be interrupted, with other processes then acting upon the products. PCE and TCE are common solvents and the presence of elevated levels of PCE and TCE daughter compounds in the groundwater, such as cis-1,2-DCE and VC, suggests that degradation of PCE and TCE is occurring.

6.1.3 Properties of Site Contaminants

This section discusses the properties of the contaminants identified at the Site that will impact their fate and transport. As described in Section 5, groups of compounds detected at concentrations above SCGs include: VOCs, SVOCs, metals, PCBs, and the emerging contaminant 1,4-dioxane. These are briefly discussed below.

VOCs

In general, VOCs readily volatilize into the atmosphere or soil vapor. At the surface, these compounds may decay and/or volatilize upon exposure to sunlight and to the atmosphere. VOCs are soluble in water and their dissolved contaminants are transported by advection and dispersion in groundwater and surface water. The same processes of advection and dispersion are responsible for the migration of these compounds in the atmosphere or the soil.

VOCs detected at concentrations above SCGs at the Site are chlorinated VOCs. These compounds have a low to moderate organic carbon-to-water partitioning coefficient and do not readily partition into the soil, making them relatively mobile in the environment. Chlorinated VOCs undergo reductive dechlorination under anaerobic conditions.

SVOCs

Generally, SVOCs are characterized by low volatility, low solubility in water, and a high organic carbon-to-water partitioning coefficient. As a result, they are relatively immobile, and typically sorb onto the soil/sediment matrix. The potential for leaching from soil to groundwater or surface water decreases as the compound's molecular weight increases. As a result, the primary transport mechanism for SVOCs is mechanically by wind and erosion/particle entrainment. Biodegradation rates are relatively low.

Phenolic compounds (phenol, 2-methylphenol, 4-methylphenol) are relatively non-volatile, and their solubility in water is high. They do not readily sorb into the soil matrix due to their low organic carbon-to-water partitioning coefficients. As a result, they are highly mobile in the environment. They are relatively biodegradable in anaerobic conditions.

PAHs are often associated with the combustion of organic materials and are commonly found at elevated levels in industrial areas and adjacent to roadways. PAHs are a class of SVOCs and are generally characterized by low volatility, low solubility in water, and a high carbon-to-water partitioning coefficient. As a result, they are relatively immobile, and typically sorb onto the soil matrix. Potential for leaching from the soil to groundwater decreases as the compound's molecular weight increases. Biodegradation rates are relatively low. One PAH compound, benzo(b)fluoranthene, was detected at one location (MW-10S) in exceedance of a groundwater SCG; this compound was not detected in RI subsurface soil samples.

Metals

Metals detected above soil SCGs include aluminum, calcium, iron, and nickel. Metals detected above groundwater SCGs include antimony (one location in unfiltered analyses; did not exceed at any location in filtered analyses), iron, magnesium, manganese, and sodium. Metals are generally persistent, and they may form complexes with other elements. They do not volatilize or degrade. However, in their soluble form, metals are mobile in groundwater. The preference of metals towards soil sorption as opposed to dissolution in water depends mostly on the acidity or alkalinity of the system.

PCBs

One PCB (Aroclor 1254) was detected at one location above a groundwater SCG. PCBs are generally relatively stable compounds, characterized by low solubility, low volatility, and high resistance to degradation. They readily sorb into soil or sediments due to a high organic carbon-to-water partitioning coefficient. As a result, PCBs are quite immobile in the environment and are typically confined to soil or sediment matrices.

The persistence of PCBs increases with an increase in the degree of chlorination whereby mono-, di-, and trichlorinated biphenyls biodegrade relatively rapidly, and tetrachlorinated biphenyls biodegrade slowly, and higher chlorinated biphenyls are resistant to biodegradation. Aroclor is a commonly known trade name for commercial mixtures of PCBs. The Aroclor mixtures have a distinguishing suffix number that indicates the degree of chlorination. The first two digits generally refer to the number of carbon atoms in the phenyl rings (for PCBs this is 10 or 12), the second two numbers indicate the percentage of chlorine by mass in the mixture. For example, the name Aroclor 1254 means that the mixture contains approximately 54% chlorine by weight. Therefore, the Aroclor detected at the Site, Aroclor 1254, is a higher chlorinated biphenyl, which is very resistant to biodegradation.

1,4-Dioxane

The emergent contaminant 1,4-dioxane may occur at sites contaminated with certain chlorinated solvents (particularly 1,1,1-TCA as it was used as a stabilizer for such solvents until 1995). It oxidizes when in sunlight and is short-lived when exposed to the atmosphere. However, 1,4-dioxane has low sorption to soils but is miscible in water and likely to leach from soil to groundwater. Once in the groundwater 1,4-dioxane has low volatilization and little potential for vapor intrusion which would then lead to atmospheric breakdown. Advection and dispersion are the main transportation mechanisms. Because 1,4-dioxane mixes readily with water, it can migrate rapidly in groundwater and is relatively resistant to biodegradation in the subsurface. Aerobic degradation is possible but, as DO is necessary, rates may be inhibited by steps to treat common co-occurring chlorinated solvents where anaerobic conditions are desirable.

6.2 Fate and Transport in the Unsaturated Zone

6.2.1 Migration

The propagation of contaminants in the unsaturated zone is dominated by three processes: migration of the dissolved phase contaminants with infiltrating precipitation; migration of the volatilized contaminants in the soil vapor; and migration of the sorbed contamination with fugitive dust emissions or surface runoff. The soil at the Site is located under a relatively impervious cover (either pavement or concrete). Infiltration from precipitation across the Site area is limited to the cracks and joints of the pavement and concrete surfaces. Therefore, the extent of the infiltration-induced migration is likely to be limited. The flow is mostly gravity-driven and directed downwards. Such downward migration through the unsaturated zone may constitute a source of contamination of the saturated zone below. Infiltration-induced migration is expected to be higher for the contaminants with higher solubility, such as the VOCs and 1,4-dioxane, and lower for PAHs because of their lower solubility in water.

For metals, the degree of solubility is determined primarily by the type of metal and the pH of the environment with a general decrease in metals solubility with increasing pH. According to the purge logs for monitoring wells and piezometers sampled during site investigations, the pH at the Site ranges from 6.39 to 8.58, which suggests limited solubility.

Contaminants can enter the soil vapor through the process of volatilization. There are elevated levels of VOCs present at the Site and the Site and vicinity is almost entirely paved. As a result, the migration of contaminants through the soil vapor could be significant. Separated from direct contact with the atmosphere, the soil vapor will tend to migrate laterally, possibly at great distances, and seek discharge points at discrete locations, such as basements or underground sewers.

The immediate Site area contains little unvegetated and unpaved areas. The Site is covered with asphalt and concrete. There is no exposed soil at the Site to generate fugitive dust emissions. Likewise, the erosion and transport of surface soils by runoff is not present onsite. Contamination adsorbed into soils is unlikely to migrate via the pathways of dust emissions or runoff transport.

6.2.2 Degradation

Generally, the occurrence and rates of unsaturated zone degradation have to be determined by means of field studies, such as respiration tests. However, unsaturated zone biodegradation is limited by the amount of moisture present in the soil and transport processes between bacteria and contaminants.

Sufficient moisture for active biological growth may not be present at all locations where contamination is elevated. Also, without a continuous aqueous phase, mass transfer between the bacteria and contaminants will be low, especially for low mobility compounds such as PAHs, PCBs, and metals. These conditions tend to limit the amount of natural biodegradation of some compounds that will occur in the unsaturated zone.

Because the Site area is mostly paved or covered by buildings and the unsaturated zone is not exposed to the action of sunlight and high temperature in the summer, rates of abiotic degradation are likely to be very low, even in the top-most layers. In general, rates of contaminant degradation in the unsaturated zone are expected to be relatively low.

6.3 Fate and Transport in the Saturated Zone

6.3.1 Migration

Contaminant migration in the saturated zone takes place predominantly by means of the transport of the dissolved-phase contamination in groundwater. The dominant factors are the direction of groundwater flow within the aquifer, the hydraulic gradient, the hydraulic conductivity of the aquifer material (both the average value and spatial distribution) and the chemical composition of the soil matrix. VOCs may also migrate from the groundwater/soil to soil vapor in the unsaturated zone.

Unconfined groundwater occurs at the Site and is found within the natural unconsolidated deposits overlying bedrock. Bedrock groundwater is semi-confined. The depth to groundwater ranges from about 2.5 to 8 ft bgs in the overburden and 4.5 to 12 ft bgs in the bedrock across the Site.

VOCs (primarily chlorinated), select SVOCs, one PCB, metals, and the emergent contaminant 1,4-dioxane were detected above SCGs in groundwater samples.

Figures 5-5 through 5-13 present groundwater iso-concentration contours for TCE, cis-1,2-DCE, VC, 1,1,1-TCA, and total site-specific chlorinated VOCs based on the 2020 RI analytical results. The general pattern of VOC concentrations in groundwater suggests that the source area is the former underground tank area with downgradient migration in both overburden and bedrock. The former tank area has been remediated though past IRMs; however, residual contamination exists.

It is known from previous investigations at the Site that the VOC plume in bedrock extends beyond the 1.006 acre BCP Site boundary to the parking lot to the south and east of the Site boundary and to the southern property line for 6600 Walmore Road.

Vertical gradients are generally downward in the vicinity of the Site. Historical transmissivity in select bedrock wells at the Site was calculated at 5.6×10^1 ft^2/day to 1.17×10^3 ft^2/day during pulse interference testing in the RAR investigations (Parsons, 2003; 2004a, 2004b, 2007).

6.3.2 Degradation

In groundwater, the rate of degradation of chlorinated VOCs is greater in anaerobic environments than in aerobic environments. The predominant mechanism for the degradation of these compounds is reductive dechlorination. The likelihood of the occurrence of this pathway can be assessed using the following indicators (after the *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water*, USEPA 1998). **Appendix A** summarizes groundwater analytical data that was collected in the vicinity of the Site during previous phases of investigation, pilot tests, IRMs, an in-situ injection remedy application, and during this RI. This data includes both laboratory analytical results and field measured results for the chlorinated VOC and MNA parameters.

The ORP measurements recorded for wells sampled in September-October 2020 indicated 39 of 43 wells had negative ORP values, which suggests an anaerobic environment. DHC bacteria were present at sufficient populations to indicate conditions for biodegradation are favorable. The presence of TCE daughter products cis-1,2-DCE and VC suggests that degradation of TCE is occurring.

6.4 Summary

6.4.1 Contaminant Evaluation

During the BCP RI, chlorinated VOCs were observed in subsurface soil and groundwater at similar concentrations and in similar locations as documented during the VCP phase of site investigations and remedies. As such, chlorinated VOCs (PCE, TCE, 1,2-DCE, VC, 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethane (1,1-DCA)) are considered to be contaminants of potential concern.

Phenol and phenolic compounds were observed in groundwater at similar concentrations and in similar locations as documented during the VCP phase of site investigations and remedies. Phenol is considered to be a contaminant of potential concern.

The emerging contaminant 1,4-dioxane exceeded current NYSDOH SCGs for groundwater. It is considered to be a contaminant of potential concern.

MEK was detected in subsurface soil above the Unrestricted Use and Protection of Groundwater SCOs but below the Industrial Use SCO. MEK was not detected in groundwater. Given no groundwater impact and soil concentrations below Industrial Use SCOs and the current and most likely future use for the Site as industrial, MEK is not considered to be a contaminant of potential concern.

Benzene and xylene were detected at low levels above groundwater SCGs in four wells located within the southern bioreactor trench. These compounds were also detected at similarly low levels in the southern bioreactor trench in historical samples. Considering the occurrence within only the southern bioreactor trench, infrequent detections and low concentrations, these compounds are not considered to be contaminants of potential concern.

Aluminum, calcium, and iron were detected in subsurface soil above Unrestricted Use SCOs; there are no Protection of Groundwater or Industrial Use SCOs for these metals. Nickel was detected in subsurface soil above the Unrestricted Use SCO but below the Protection of Groundwater and Industrial Use SCOs. Nickel was not detected above SCGs in groundwater and there are no groundwater SCGs for aluminum or calcium. Iron, a common metal and an element added to VCP remedial injections, exceeded SCGs for groundwater. Each of these metals were detected at consistent concentrations across the Site, indicating the concentrations are indicative of native conditions and not a result of historical site activities. Given the apparent natural consistency for these metals, soil concentrations below Industrial Use SCOs, low mobility, and the current and most likely industrial future use for the Site, these metals are not considered to be contaminants of potential concern.

Antimony, iron, magnesium, manganese, and sodium exceeded SCGs for groundwater; antimony slightly exceeded SCGs at only one location and the other metals exhibited consistent concentrations across the Site, indicating the concentrations are indicative of native conditions and not a result of historical site activities. Given the apparent natural consistency for these metals, soil concentrations below Industrial Use SCOs, low mobility, and the current and most likely industrial future use for the Site, these metals are not considered to be contaminants of potential concern.

Benzo(b)fluoranthene was detected above SCGs at a low concentration in groundwater at one location (MW-10S). There were no SCG exceedances in subsurface soil for this or any other SVOC. Considering the low mobility, infrequent detections and low concentrations, this compound is not considered to be a contaminant of potential concern.

Aroclor 1254 was detected above SCGs at a low concentration in groundwater at one location (INJ-8D). There were no SCG exceedances in subsurface soil for this or any other PCB. Considering the low mobility, infrequent detections and low concentrations, this compound is not considered to be a contaminant of potential concern.

6.4.2 Contaminant of Potential Concern Summary

Contaminants of potential concern (CPCs) at the Site are chlorinated VOCs (PCE, TCE, 1,2-DCE, VC, 1,1,1-TCA, 1,1-DCA), phenol, and 1,4-dioxane. The presence of these compounds in soil and groundwater are likely associated with past manufacturing activities.

VOCs can enter the soil vapor through the process of volatilization. Investigation information has demonstrated that migration of VOCs has occurred historically in the main Saint-Gobain building down gradient of the Site. PCE concentrations detected within historical sub-slab samples required mitigation according to the NYSDOH decision matrices. An SSD system was installed in the Saint-Gobain office building in November 2010 and continues to operate and is currently inspected quarterly. A January 2016 letter to NYSDEC detailed additional sampling of the SSD system conducted in 2015 with the system running (August) and off (October) for 24-hours with all sampled VOCs being non-detect. In addition, April 2021 air sampling results with the SSD system running were all below the Air Guideline Values derived by NYSDOH (NYSDOH, October 2006, Updated September 2013 and August 2015).

Infiltration-induced migration is expected to be high for the VOC contaminants due to their higher solubility. VOCs migrate in the saturated zone predominantly by means of the transport of the dissolved-phase contamination in groundwater. The extent of bedrock groundwater VOC impact has been determined with concentrations highest near the former underground concrete tank and progressively decreasing to non-detect values downgradient (south) of the former tank. Contaminant travel in the bedrock is likely along preferential pathways (i.e., interconnected fractures within the rock). Phenol impacts in the groundwater are localized to the area south-southwest of the former tank. 1,4-Dioxane was detected at low levels throughout the BCP site in the overburden and downgradient (south-southwest) of the former tank in the bedrock following the general direction of groundwater flow.

7. QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT AND FISH AND WILDLIFE ASSESSMENT

This section presents the qualitative Human Health Exposure Assessment (HHEA) and fish and wildlife resource impact analysis (FWRIA) for the Site. The qualitative HHEA uses data and information collected during the historical VCP investigations and this RI to assess human health exposure in the immediate and surrounding areas. The qualitative HHEA provides an evaluation of potential adverse health effects under current and potential future Site conditions that may result from exposure to contaminants attributable to former activities at the Site.

7.1 Qualitative Human Health Exposure Assessment

This qualitative HHEA follows the general format and procedures set forth in the USEPA's Risk Assessment Guidance for Superfund (RAGS) (USEPA 1997). The HHEA includes three components: Hazard Identification, Exposure Assessment, and Toxicity Assessment. This qualitative HHEA uses data and information collected during Site investigations to assess human health exposure in the immediate and surrounding areas and provides an evaluation of potential adverse health effects, under current and potential future Site conditions, that may result from exposure to contaminants at the Site.

7.1.1 Identification of Chemicals of Potential Concern

Based upon the analytical data obtained and presented in Section 5, CPCs were identified in Section 6 as chlorinated VOCs (PCE, TCE, 1,2-DCE, VC, 1,1,1-TCA, 1,1-DCA), phenol, and 1,4-dioxane based on the frequency of detection, range of concentrations, and potential for migration, as well as whether the detected analytes exceeded applicable SCGs. A "medium of potential concern" is identified as a physical medium (e.g., soil or groundwater) in which one or more contaminants were detected at concentrations exceeding their SCGs.

Surface soil, sediment, and surface water are not present at the Site; therefore, no CPCs are identified for these matrices.

CPCs detected in subsurface soil that exceeded SCGs include chlorinated VOCs (PCE, TCE, 1,2-DCE, VC, 1,1,1-TCA, 1,1-DCA) and phenol (historical data). Subsurface soil analytical results were compared to Part 375 Unrestricted Use, Protection of Groundwater, and Industrial Use SCOs as presented on **Tables 5-1 and 5-2.**

CPCs detected in groundwater that exceeded SCGs include chlorinated VOCs (PCE, TCE, 1,2-DCE, VC, 1,1,1-TCA, 1,1-DCA), phenol, and 1,4-dioxane. Groundwater analytical results were compared to NYSDEC TOGS 1.1.1 (**Table 5-3 and 5-5**). The emergent contaminant 1,4-dioxane was compared to drinking water standards presented in *Public Water Systems and NYS Drinking Water Standards for PFOA, PFOS, and 1,4-Dioxane*, NYSDOH, Center for Environmental Health, 9/2020 (**Table 5-4**).

Indoor air and sub-slab soil vapor were completed as part of the VCP period. Sub-slab soil vapor sampling performed during the VCP indicated PCE concentrations required mitigation according to the NYSDOH decision matrices. An SSD system was installed in the main office building west-southwest of the Site and is currently inspected quarterly. A January 2016 letter to NYSDEC detailed additional sampling of the SSD system conducted in late 2015 with the system running (August) and off (October) for 24-hours with all sampled VOCs being non-detect. In addition, April 2021 air sampling results with the system running were all below the Air Guideline Values derived by NYSDOH (NYSDOH, October 2006, Updated September 2013 and August 2015).

Volatilization of VOCs from groundwater to indoor air may occur in the existing or future on-site building(s). Phenol and 1,4-dioxane are not readily volatile; therefore, migration of these contaminants through the vapor phase is not expected.

7.2 Exposure Pathways

An exposure pathway is a manner by which an individual may come in contact with a contaminant. The elements of a completed exposure pathway include: the contaminated environmental media (e.g., soil, soil vapor/air, and groundwater); the receptor (e.g., construction worker, industrial worker, visitors) exposed to the contamination; and the routes of exposure or how the contaminant enters the body (e.g., inhalation, ingestion, and/or dermal contact).

The Site itself is covered with asphalt and paved parking areas. The Ekonol Polyester Resins building to the north typically has 1 to 3 staff occupying the building on workdays. The Saint-Gobain Ceramics and Plastics facility is located west-southwest of the Site and has employees onsite daily. Future use of the Site would be in conjunction with its current zoning for industrial use. Under current or future conditions, human contact with CPCs can be expected to occur primarily by three types of receptors: vendors, visitors, or trespassers who may enter the property; construction/utility workers who may be involved in construction/repairs to existing buildings or systems or future buildings or systems; and industrial workers.

The subsections below present the exposure pathways assessed for the Site under current and future land use scenarios, respectively. There are no exposure pathways from surface soil under current conditions as the VOC and metal contaminants in soils are currently covered. However, there is potential for future construction/utility workers to have contact with soils during excavation work. There are potential exposure pathways from soil vapor through the inhalation of VOCs to construction workers, industrial workers, and the visitors under both the current and future use scenarios. Exposure pathways are not complete for the public under current conditions for soil, outdoor air, or for any receptors for groundwater.

The following subsections discuss the rationale for identifying completed exposure pathways.

7.2.1 Soil and Ground Surface Materials

As discussed in Section 6.2.1 above, the Site is covered with asphalt and concrete pavement therefore there is no surface soil/ground surface material pathway. The only potential completed exposure pathway is for subsurface soil for construction/utility workers who could come into contact with contaminated soil during intrusive activities both under current and future conditions. Potential exposure to these materials by current or future vendors, visitors, or industrial workers is unlikely.

7.2.2 Outdoor Air

Three outdoor air samples were collected in March 2009 during VCP site investigations. No VOCs were detected in the samples at the laboratory reporting limits. The levels are not considered a concern.

7.2.3 Indoor Air and Sub-Slab Vapor

A January 2016 letter to NYSDEC detailed additional sampling of the SSD system conducted in late 2015 with the system running (August) and off (October) for 24-hours with all sampled VOCs being non-detect. April 2021 air sampling results were all below the Air Guideline Values derived by NYSDOH (NYSDOH, October 2006, Updated September 2013 and August 2015).

Based on the SSD system being in place since November 2010 and operating without interruption (except for fan replacement in 2015) in the Saint-Gobain offices, and 2015 and 2021 indoor air data being below guidelines, there is no completed indoor air pathway under current conditions. However, a completed exposure pathway to employees may occur in the future.

7.2.4 Groundwater

Under the current use scenario, groundwater is not known to be used as a potable water supply or for any other known industrial purposes in the vicinity of the Site. Drinking water is supplied by the Town of Wheatfield. Therefore, it is not a completed exposure pathway under the current use scenario. It is not anticipated that in the future that on-site groundwater would be used for potable purposes. Construction workers at the Site could be exposed to groundwater contaminants during current or future intrusive activities through dermal contact, ingestion, and/or inhalation.

7.2.5 Surface Water/Sediment

There is no surface water or sediment present on the Site, therefore, an exposure pathway does not exist.

7.2.6 Routes of Exposure

VOCs present the greatest exposure potential through inhalation. VOCs, phenol, and 1,4-dioxane can also provide exposure through dermal contact and ingestion if encountered in subsurface soil or groundwater.

7.2.7 Summary

Under some current and future use conditions, there are completed exposure pathways from indoor air, soil, and groundwater, but only for the construction worker. For future use conditions, additional completed exposure pathways from soil, groundwater, or outdoor air may be present under intrusive soil/excavation conditions.

7.3 Fish and Wildlife Resources Impact Analysis

The need to perform a FWRIA is discussed in the NYSDEC document titled *Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites*, dated October 1994 (NYSDEC, 1994). The NYSDEC requires a FWRIA when there is a significant potential for fish and wildlife resources to be present at a site, and there is a significant potential for the migration of residuals to these resources.

The DER-10 Appendix 3C Fish and Wildlife Resources Impact Analysis Decision Key has been completed as part of this RI (**Appendix L**). The New York State Environmental Resource Mapper was used in a preliminary search at the Site to evaluate the need for a FWIA. The mapping tool indicated the potential presence of rare, threatened, and endangered species. Accordingly, correspondence was initiated during the development of the RIWP on September 4, 2019 with the U.S. Fish and Wildlife Service and the NYSDEC Division of Fish, Wildlife & Marine Resources, New York State Natural Heritage Program. The U.S. Fish and Wildlife Service responded with the presence of the Northern Long-eared Bat (Myotis septentrionalis) as a threatened species within the area; The NYSDEC Division of Fish, Wildlife & Marine Resources, New York Natural Heritage Program responded that two bird species, the Short-eared Owl (Asio flammmeus), listed as endangered, and Northern Harrier (Circus hudsonius), listed as threatened, have been documented in the vicinity of the Site (**Appendix L**). There are no listed critical habitats within the project area under the jurisdiction of the U.S. Fish and Wildlife Service. There is no tree habitat for bats or birds within the Site. From the sampling performed at the Site, the concentrations of constituents of concern appear to be in groundwater and soil. Therefore, in accordance with DER-10 Appendix 3C, performance of an FWRIA is not planned for this Site. If significant impacts are identified migrating onto adjacent property, or new habitat for these species is identified, the need to perform a FWRIA will be further discussed with NYSDEC.

8. CONCLUSIONS

8.1 Site Background Summary

The Site occupies approximately 1.006 acres in the Town of Wheatfield, Niagara County, New York. The Ekonol Polyester Resins building was historically (and is currently) used for production of a polyester resin that is used as a spray-on coating for turbine engines. The Carborundum Company opened operations at the polyester resins facility in May 1963. A series of corporate ownership changes (sales and mergers) occurred over the next several decades, including sale of the property at 6600 Walmore Road. Operations of the polyester resins facility was maintained by the Carborundum Company (operating as a subsidiary under the umbrella of British Petroleum) up until 1996 when operations were sold to Saint-Gobain, the current operator. The current and reasonably anticipated future land use is industrial.

Site investigation and remediation activities have been ongoing at the Site since the 1999 removal of an underground concrete tank adjacent to the south side of the building. The tank was used from the mid-1970s through 1999 for collection of wastewater rinsate from the floor drains inside the process area of the plant. After the tank closure and soil excavation, a multi-phase Site Characterization Study and series of IRMs were completed prior to and following entry into New York's VCP in 2003 (VCP Site No. V00653-9). Investigations included geophysical surveys, completion of soil borings, installation of monitoring wells, collection and analysis of subsurface soil, and groundwater samples, and sub-slab soil vapor and indoor air and outdoor air samples at a nearby manufacturing building.

Remedial actions were conducted under the VCP between 2010 and 2012. Overburden remedial action included installation of two parallel bioreactor trenches excavated to bedrock (approximately 15 feet bgs), filled with a mixture of gravel and organic wood-chip mulch. The mulch was covered with a non-woven geotextile to prevent fines from entering the bioreactor, additional gravel, and a high-strength woven geotextile. The trenches were designed to create a preferential pathway for overburden groundwater flow with groundwater-mulch contact enhancing natural biodegradation of contaminants. Bedrock groundwater was addressed via injections of emulsified vegetable oil into the bedrock aquifer, followed by monitoring to assess if additional injection treatments were necessary to achieve biodegradation of site contaminants.

An SMP was developed and submitted to NYSDEC in July 2015 (Parsons, 2015). The SMP outlined the long-term Institutional and Engineering Controls, OM&M, and reporting requirements for the Site. A deed restriction for the Site dated May 22, 2014 was included as an attachment in the SMP. No comments or formal NYSDEC approval were received on the submitted SMP. The recommended OM&M plan presented in the SMP was implemented as of fall 2015.

In November 2016, NYSDEC announced the planned phase-out of the VCP by June 28, 2018. On May 25, 2018, NYSDEC notified Elm Holdings Inc. that the Site was not going to receive a certificate of completion under the VCP and that the Site should transition to another regulated program. Elm Holdings Inc. applied to enter the Site into the BCP. The application was accepted, and the BCA was executed in May 2019.

8.2 Summary of Investigation

The RI field work was completed in accordance with the NYSDEC-approved RIWP (AECOM, 2020). There were no significant deviations from the RIWP during the performance of the work. Nine new soil borings and two new monitoring wells (one overburden and one bedrock) were installed to address potential data gaps in the existing data. During the performance of the borings, subsurface soil samples were collected and analyzed for TCL VOCs, TCL SVOCs, TAL metals, PCBs, pesticides, and emerging contaminants 1,4-dioxane and PFAS. Twelve groundwater samples were collected from the two new and ten existing monitoring wells within the Site for these same parameters. An additional 31 groundwater samples were collected for the VCP SMP fall semi-annual monitoring list to assess groundwater quality within and downgradient of the Site.

The following headings summarize findings of the investigation.

Soil

Surface Soil

No surface soil exists at Site. No samples were planned or collected.

Subsurface Soil

Chlorinated VOCs (TCE, cis-1,2-DCE, VC) and MEK were detected above the Unrestricted Use SCO or Protection of Groundwater SCO in at least one sample. All VOCs in subsurface soil collected during the 2020 RI were below the respective Industrial Use SCOs. The general concentration range and occurrence of chlorinated VOCs were consistent with previous investigation data – greatest concentrations were located in proximity to the former underground concrete tank with concentrations decreasing with distance from the tank.

None of the 13 subsurface soil samples had SVOCs that were detected above the relevant SCOs.

None of the 13 subsurface soil samples had PCBs that were detected above the relevant SCOs.

None of the 13 subsurface soil samples had pesticides that were detected above the relevant SCOs.

Metals detected above Unrestricted Use SCOs in each sample included aluminum, calcium, and iron; there are no Protection of Groundwater or Industrial Use SCOs for these metals. Nickel was detected above the Unrestricted Use SCO but below Protection of Groundwater and Industrial Use SCOs in eight of ten samples. No other metals were detected at concentrations exceeding SCOs.

The emerging contaminant 1,4-dioxane was detected in ten subsurface soil samples plus the one duplicate from the nine locations. None of the detections were in exceedance of SCOs.

The emerging contaminants PFAS were not detected in any of the ten subsurface soil samples or the duplicate from the nine locations sampled.

Groundwater

Chlorinated VOCs TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, VC, 1,1,1-TCA and 1,1-DCA were detected above TOGS 1.1.1 criteria in at least one sample. TCA and DCA were not observed in overburden groundwater. Concentrations and occurrence of these compounds are consistent with historical studies at the Site. Benzene and xylene were also detected in slight exceedance of the relevant criteria in Site overburden groundwater (four and two locations, respectively; all locations within the southern bioreactor trench); these chemicals are noted in historical data from the VCP.

Six SVOCs (phenolic compounds, benzo(b)fluoranthene, and diethylphthalate) were detected at a concentration above their respective TOGS 1.1.1 criteria in at least one sample. None of these parameters were present above SCOs in subsurface soil.

One PCB (Aroclor 1254) was detected at an estimated concentration above criterion (0.09 µg/L) at one sample location (INJ-8D) at 0.46 J µg/L.

One pesticide (Endosulfan I) was detected at one location (PMW-1S [0.1 µg/L]). There is no Class GA groundwater standard for Endosulfan I listed in TOGS 1.1.1.

Metals at concentrations exceeding the groundwater criteria were detected in samples from all 12 BCP Site Monitoring locations. Metals exceeding the groundwater criteria included antimony, iron, magnesium, manganese, and sodium. From 2008 through 2012, substrate, additives, and buffers were injected into the bedrock. Some elevated metals concentrations may be attributed to these injections as injectate included calcium carbonate, sodium bicarbonate (pH buffer), sodium lactate (ingredient of the emulsified vegetable oil), and sodium bromide (increase conductivity). Additionally, as part of the trench construction sand was installed as an iron source.

Samples for the emerging contaminant 1,4-dioxane were collected at the 12 BCP Site Monitoring locations. Detections in samples from nine locations ranged from 0.54 to 31 µg/L. 1,4-dioxane was detected above criteria at seven locations: MW-3S, MW-4S, MW-13S PMW-10S, INJ-8D, PMW-1D, and RMW-4D.

The emerging contaminants PFAS were collected at the 12 BCP Site Monitoring locations. At least one of eight different PFAS was detected in all 12 locations, the field duplicate, and a sample collected from the municipal water source used by the drill crew (drill water sample). None of the detections were over the relevant PFAS SCGs for water samples.

Field and laboratory measurements for MNA parameters collected during monitoring well purging and sampling were consistent with prior investigations. ORP, DO, TOC, sulfide, sulfate and microbial analyses continue to be in a conducive range for anaerobic reductive dechlorination to occur.

Surface Water and Sediment

No surface water or sediment exists at Site. No samples were planned or collected.

VI

Indoor air and sub-slab soil vapor samples were collected between 2009 and 2015 as part of site investigations during the VCP period. TCE, PCE, and cis-1,2-DCE were detected at concentrations above method detection limits (GZA, 2009). PCE concentrations detected within the sub-slab samples at that time required mitigation according to NYSDOH decision matrices. An SSD system was installed in the Saint-Gobain offices in November 2010 and has been inspected quarterly thereafter. A January 2016 letter to the NYSDEC detailed additional sampling of the SSD system conducted in 2015 with the system running (August) and off (October) for 24-hours with all sampled VOCs being non-detect (Parsons, 2016). In addition, April 2021 air sampling results collected as part of this RI with the SSD system operating were all below the Air Guideline Values derived by NYSDOH (NYSDOH, October 2006, Updated September 2013 and August 2015).

8.3 Assessment

With the exception of 1,4-dioxane not previously investigated, the RI did not identify any contaminants that were not previously documented at the Site. The general occurrence and range of concentrations for the contaminants is consistent with prior investigations and semi-annual monitoring conducted under the VCP 2012 – 2018. The current data confirmed the trend of overall reduction in chlorinated VOC concentrations pursuant to VCP remedial actions.

Current data supports the site conceptual model indicating the former concrete storage tank is the likely source for the contaminants of concern. Soil and groundwater concentrations for these contaminants are remnant expressions of the remediated source area. VCP phase in situ remedial actions focusing on reductive dechlorination in the overburden and bedrock have been effective in reducing remnant concentrations in overburden and bedrock groundwater. The remedies have produced significant reduction of source area and downgradient contaminant concentrations as demonstrated in the concentration vs. time series plots in **Appendix A**. Greatly reduced levels of PCE, TCE and TCA, along with appreciable levels of 1,2-DCE, VC, and 1,1-DCA and ethene indicate that the enhanced biodegradation remedy has been effective at the Site. Favorable conditions for reductive anaerobic dechlorination to occur also demonstrate such degradation has occurred and is likely to continue to occur.

During the BCP RI, chlorinated VOCs were observed in subsurface soil and groundwater at similar concentrations and in similar locations as documented during the VCP phase of site investigations and remedies. As such, chlorinated VOCs (PCE, TCE, 1,2-DCE, VC, 1,1,1-TCA, 1,1-DCA) are considered to be contaminants of potential concern.

Phenol and phenolic compounds were observed in groundwater at similar concentrations and in similar locations as documented during the VCP phase of site investigations and remedies. Phenol is considered to be a contaminant of potential concern. The emerging contaminant 1,4-dioxane exceeded current NYSDOH SCGs for groundwater. It is considered to be a contaminant of potential concern.

Data show that the VCP enhanced reductive dechlorination remedies have been effective at reducing concentrations for contaminants of potential concern and that the remedies have established a favorable setting for continued reductions. However, some locations with higher concentrations may benefit from remedy enhancements. The information obtained to date should be sufficient for use in the selection of enhancements of the remedial approach for the Site.

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TABLES

Table 2-1

Existing Monitoring Well Completion Details
2020 Remedial Investigation
Ekonol Polyester Resins BCP Site
Wheatfield, NY

Well ID	Date Installation Complete	Top of Rock (ft bgs)	Bottom of Boring (ft bgs)	Top of Riser Elevation (ft AMSL)	Riser Material	Well Diameter (Inches)	Depth to Groundwater (ft from TOC) (09-08-2020)(3)	Groundwater Elevation (ft AMSL)(3)	4 in. Steel Casing (ft bgs)	Grout Interval (ft bgs)	Bentonite Seal Interval (ft bgs)	Sand Interval (ft bgs)	Well Screen Interval (ft bgs) (4)	Screen Length (ft) (4)	Sump Interval (ft bgs)	Sump Length (ft)	Surface Completion
INJ- 1	12/13/2007	12.5	25.8	585.70	open borehole	4	8.41	577.29	0-14.5	0-14.5	-	-	14.5-25.8	11.2	-	-	Flushmount
INJ- 2	12/11/2007	13	25.6	585.54	open borehole	4	8.42	577.12	0-15	0-15	-	-	15-25.6	10.6	-	-	Flushmount
INJ- 3	11/28/2007	11	24.9	585.35	open borehole	4	7.60	577.75	0-13	0-14	-	-	13-24.9	11.9	-	-	Flushmount
INJ- 4	11/27/2007	12.5	25.6	585.58	open borehole	4	7.88	577.70	0-14.5	0-14.5	-	-	14.5-25.6	11.1	-	-	Flushmount
INJ- 5	12/6/2007	12.5	25.3	585.60	open borehole	4	7.22	578.38	0-14.5	0-14.5	-	-	14.5-25.3	10.8	-	-	Flushmount
INJ- 6D	5/27/2011	12	24.5	585.67	open borehole	4	8.21	577.46	0-14	0-14	-	-	14-24.5	10.6	-	-	Flushmount
INJ- 7D	1/19/2011	13	25	585.89	open borehole	4	8.42	577.47	0-15	0-15	-	-	15-25	10	-	-	Flushmount
INJ- 8D	1/19/2011	12	24	585.85	open borehole	4	8.55	577.30	0-15	0-15	-	-	14-24	10	-	-	Flushmount
INJ- 9D	1/18/2011	12	25	585.74	open borehole	4	7.99	577.75	0-15	0-15	-	-	14-25	11	-	-	Flushmount
INJ-10D	1/18/2011	12	24	585.24	open borehole	4	7.84	577.40	0-15	0-15	-	-	14-24	10	-	-	Flushmount
INJ-11D	1/19/2011	13	24	585.76	open borehole	4	8.52	577.24	0-15.2	0-15.2	-	-	15-24	9	-	-	Flushmount
INJ-12D	1/18/2011	12	25	585.59	open borehole	4	8.42	577.17	0-15	0-15	-	-	14-25	11	-	-	Flushmount
INJ-13D	5/26/2011	13	24	585.78	open borehole	4	8.53	577.25	0-15	0-15	-	-	15-24	9	-	-	Flushmount
MW- 1S	10/22/2001	15.7	15.7	585.06	PVC	2	6.34	578.72	-	0-1	1-4	4-15.7	5.7-15.7	20	-	-	Flushmount
MW- 2S	10/23/2001	12.5	12.5	585.11	PVC	2	2.50	582.61	-	0-1	1-4	4-12.5	7.5-12.5	10	-	-	Flushmount
MW- 3S	10/23/2001	12.6	12.6	584.83	PVC	2	6.25	578.58	-	0-1	1-4	4-12.6	7.6-12.6	10.1	-	-	Flushmount
MW- 4S	10/24/2001	13.2	13.2	585.79	PVC	2	7.19	578.60	-	0-1	1-4	4-13.2	8.2-13.2	10	-	-	Flushmount
MW- 5S	6/10/2002	15.1	15.1	585.66	Steel	2	8.06	577.60	-	0-4	4-8	8-15.1	10.1-15.1	10	-	-	Flushmount
MW- 6S	6/14/2002	14.8	14.8	585.64	Steel	2	7.12	578.52	-	0-3	3-8	8-14.8	9.8-14.8	10	-	-	Flushmount
MW- 7D	10/3/2006	13.4	30.4	585.87	open borehole	4	9.08	577.08	0-15.4	0-15.4	-	-	15.4-30.4	15	-	-	Flushmount
MW- 7S	6/17/2002	13	13	586.46	Steel	2	7.02	579.44	-	0-3	3-7	7-13	8-13	5	-	-	Flushmount
MW- 8S	6/19/2002	14.2	14.2	586.19	Steel	2	5.85	580.34	-	0-2	2-7	7-14.2	9.2-14.2	5	-	-	Flushmount
MW- 9S	6/14/2002	14.2	14.2	586.10	Steel	2	6.68	579.42	-	0-5	5-8	8-14.2	9.2-14.2	5	-	-	Flushmount
MW-10D	7/2/2002	14.8	31.5	585.47	Steel	2	8.42	577.05	0-18	0-13	13-19	19-31.5	19.5-29.5	10	29.5-31.5	2	Flushmount
MW-10S	9/9/2005	12.5	12.5	585.77	Steel	2	7.19	578.58	-	0-3.5	3.5-5.5	5.5-12.5	7.5-12.5	5	-	-	Flushmount
MW-11D	7/3/2002	12.3	29.4	588.42	Steel	2	11.31	577.11	0-15	0-11	11-16	16-29.4	17.4-27.4	10	27.4-29.4	2	Stickup
MW-11S	9/8/2005	14.5	14.5	586.00	Steel	2	8.18	577.82	-	0-5	5-7	7-14.5	9.5-14.5	5	-	-	Flushmount
MW-12D	9/24/2002	18.7	35	585.85	Steel	2	8.92	576.93	0-20	0-15	15-20	20-35	20.4-30.4	10	30.4-32.40	2	Flushmount
MW-12S	9/9/2005	13.5	13.5	586.11	Steel	2	8.77	577.34	-	0-4.5	4.5-6.5	6.5-13.5	8.5-13.5	5	-	-	Flushmount
MW-13D	9/25/2002	12.7	29.9	587.89	Steel	2	11.78	576.11	0-15	0-11	11-16	16-29.9	17.9-27.9	10	27.9-29.9	2	Stickup
MW-13S (1)	9/23/2020	14	14	585.81	PVC	2	8.87	576.94	-	-	0-6.5	6.5-14	8.8-13.8	5	-	-	Flushmount
MW-14D	9/11/2003	13.5	31.25	587.70	Steel	2	10.41	577.29	0-15.5	0-13	13-17	17-31.25	19.25-29.25	10	29.25-31.25	2	Stickup
MW-15D	9/16/2003	14	30.5	585.76	Steel	2	9.70	576.06	0-15.5	0-13	13-17	17-30.5	18.5-28.5	10	28.5-30.5	2	Flushmount
MW-16D	9/15/2003	13.5	29.97	586.96	Steel	2	12.68	574.28	0-15.5	0-13	13-17	17-29.97	17.97-27.97	10	27.97-29.97	2	Stickup
MW-17D	9/12/2003	13.5	30.98	587.31	Steel	2	10.30	577.01	0-15.5	0-13	13-17	17-30.98	18.98-28.98	10	28.98-30.98	2	Stickup
MW-18D	5/11/2004	10	26	587.07	Steel	2	9.87	577.20	0-11	0-10	10-12	12-26	14-24	10	-	-	Stickup
MW-19D	5/26/2004	13	29	585.44	Steel	2	8.80	576.64	0-14	0-13	13-15	15-29	14-24	10	-	-	Flushmount
MW-20D	9/12/2005	12	30	586.17	Steel	2	9.25	576.92	0-14	0-14	14-16	16-30	18-28	10	28-30	2	Flushmount
MW-21D	10/3/2006	14.8	29.2	585.90	open borehole	4	9.33	576.57	0-16.8	0-16.8	-	-	16.8-29.2	12.4	-	-	Flushmount
MW-22D (1)	9/24/2020	13.2	24.5	585.63	open borehole	4	8.53	577.10	0-15.5	0-15.5	-	-	15.5-24.5	9	-	-	Flushmount
OR- 1SI	5/19/2011	12.8	12.8	585.80	PVC	2	2.80	583.00	-	0-5	5-7	7-12.8	7.66-12.66	5	-	-	Flushmount
OR- 2SI	5/19/2011	12.2	12.2	585.61	PVC	2	5.03	580.58	-	0-5	5-7	7-12.16	7.16-12.16	5	-	-	Flushmount
OR- 3SM	5/19/2011	13	13	585.81	PVC	2	3.12	582.69	-	0-5	5-7	7-13	8-13	5	-	-	Flushmount
OR- 4SM	5/18/2011	12.66	12.66	585.70	PVC	2	5.04	580.66	-	0-5	5-7	7-12.66	7.66-12.66	5	-	-	Flushmount
OR- 5SM	5/18/2011	12.16	12.16	585.73	PVC	2	2.89	582.84	-	0-5	5-7	7-12.16	7.16-12.16	5	-	-	Flushmount
OR- 6SM	5/18/2011	12.25	12.25	585.74	PVC	2	8.31	577.43	-	0-5	5-7	7-12.25	7.25-12.25	5	-	-	Flushmount
OR- 7SI	5/17/2011	12.33	12.33	585.76	PVC	2	2.82	582.94	-	0-5	5-7	7-12.33	7.33-12.33	5	-	-	Flushmount
OR- 8SI	5/17/2011	12.5	12.5	585.70	PVC	2	8.32	577.38	-	0-5	5-7	7-12.5	7.33-12.33	5	-	-	Flushmount
OR- 9SM	5/17/2011	12.16	12.16	585.69	PVC	2	8.13	577.56	-	0-5	5-7	7-12.16	7.16-12.16	5	-	-	Flushmount
OR-10SM	5/16/2011	12.16	12.16	585.57	PVC	2	8.11	577.46	-	0-5	5-7	7-12.16	7.16-12.16	5	-	-	Flushmount
OR-11SI	5/13/2011	12.33	12.33	585.91	PVC	2	8.23	577.68	-	0-5	5-7	7-12.33	7.33-12.33	5	-	-	Flushmount
OR-12SI	5/16/2011	12.5	12.5	585.63	PVC	2	8.16	577.47	-	0-5	5-7	7-12.5	7.5-12.5	5	-	-	Flushmount

Table 2-1

Existing Monitoring Well Completion Details
2020 Remedial Investigation
Ekonol Polyester Resins BCP Site
Wheatfield, NY

Well ID	Date Installation Complete	Top of Rock (ft bgs)	Bottom of Boring (ft bgs)	Top of Riser Elevation (ft AMSL)	Riser Material	Well Diameter (Inches)	Depth to Groundwater (ft from TOC) (09-08-2020)(3)	Groundwater Elevation (ft AMSL)(3)	4 in. Steel Casing (ft bgs)	Grout Interval (ft bgs)	Bentonite Seal Interval (ft bgs)	Sand Interval (ft bgs)	Well Screen Interval (ft bgs) (4)	Screen Length (ft) (4)	Sump Interval (ft bgs)	Sump Length (ft)	Surface Completion
OR-13SM	5/13/2011	12.75	12.75	585.80	PVC	2	8.22	577.58	-	0-5	5-7	7-12.75	7.75-12.75	5	-	-	Flushmount
OR-14SM	5/13/2011	12.16	12.16	585.68	PVC	2	8.33	577.35	-	0-5	5-7	7-12.16	7.16-12.16	5	-	-	Flushmount
OR-15SM	5/12/2011	12.42	12.42	585.85	PVC	2	7.22	578.63	-	0-5	5-7	7-12.42	7.42-12.42	5	-	-	Flushmount
OR-16SI	5/12/2011	12.58	12.58	585.74	PVC	2	7.55	578.19	-	0-5	5-7	7-12.58	7.58-12.58	5	-	-	Flushmount
OR-17SI	5/12/2011	12.66	12.66	585.74	PVC	2	7.29	578.45	-	0-5	5-7	7-12.66	7.66-12.66	5	-	-	Flushmount
OR-18SM	5/12/2018	12.66	12.66	585.51	PVC	2	7.20	578.31	-	0-5	5-7	7-12.66	7.66-12.66	5	-	-	Flushmount
PMW- 1D	12/7/2007	14.5	23.5	585.66	Steel	4	8.27	577.39	0-16.5	0-8.5	8.5-11.5	11.5-23.5	13.5-23.5	10	-	-	Flushmount
PMW- 1S	5/31/2011	12.5	12.5	586.01	PVC	2	2.85	583.16	-	0-2.5	2.5-5.5	5.5-12.5	7.5-12.5	5	-	-	Flushmount
PMW- 2D	12/4/2007	12.5	25.4	585.85	Steel	2	8.78	577.07	0-14.5	0-10.4	10.4-13.4	13.4-25.4	15.4-25.4	10	-	-	Flushmount
PMW- 2S	5/20/2011	12	12	585.75	PVC	2	3.93	581.82	-	0-2	2-5	5-12	7-12	5	-	-	Flushmount
PMW- 3D	12/11/2007	13	25.8	585.98	Steel	2	8.72	577.26	0-14.5	0-10.8	10.8-13.8	13.8-25.8	15.8-25.8	10	-	-	Flushmount
PMW- 3S	5/23/2011	12.25	12.25	585.67	PVC	2	8.2	577.47	-	0-2	2-5	5-12.25	7.25-12.25	5	-	-	Flushmount
PMW- 4D	11/26/2007	12.5	26.5	585.73	Steel	2	8.61	577.12	0-14.5	0-11	11-13.5	13.5-26	15.5-25.5	10	-	-	Flushmount
PMW- 4S	12/30/2010	12	12	585.48	PVC	2	6.95	578.53	-	0-3	3-5	5-12	7-12	5	-	-	Flushmount
PMW- 5D	12/3/2007	13	25.7	585.73	Steel	2	8.74	576.99	0-15	0-10.7	10.7-13.7	13.7-25.7	15.4-25.4	10	-	-	Flushmount
PMW- 5S	5/20/2011	12	12	585.84	PVC	2	3.47	582.37	-	0-2	2-5	5-12	7-12	5	-	-	Flushmount
PMW- 6D	12/4/2007	12.5	25.9	585.86	Steel	2	8.9	576.96	0-15	0-11	11-14	14-25.9	15.9-25.9	10	-	-	Flushmount
PMW- 6S	5/31/2011	12.25	12.25	585.57	PVC	2	7.71	577.86	-	0-2	2-5	5-12.25	7.25-12.25	5	-	-	Flushmount
PMW- 7D	11/30/2007	12.2	25.5	585.82	Steel	2	8.95	576.87	0-14	0-10.5	10.5-13.5	13.5-25.5	15.5-25.5	10	-	-	Flushmount
PMW- 7S	5/23/2011	11.83	11.83	585.62	PVC	2	8.08	577.54	-	0-2	2-5	5-11.83	6.83-11.83	5	-	-	Flushmount
PMW- 8D	11/27/2007	12.3	25.6	585.46	Steel	2	4.61	580.85	0-14.5	0-10.3	10.3-13.3	13.3-25.6	15.6-25.6	10	-	-	Flushmount
PMW- 8S	5/23/2011	12	12	585.64	PVC	2	8.29	577.35	-	0-2	2-5	5-12	7-12	5	-	-	Flushmount
PMW- 9D	5/26/2011	12	24	585.92	open borehole	4	8.2	577.72	0-14	0-14	-	-	14-24	10	-	-	Flushmount
PMW- 9S	5/31/2011	12.66	12.66	585.76	PVC	2	8.38	577.38	-	0-3	3-6	6-12.66	7.66-12.66	5	-	-	Flushmount
PMW-10D	6/1/2011	12	23.5	585.68	open borehole	4	8.15	577.53	0-14	0-14	-	-	14-23.5	9.5	-	-	Flushmount
PMW-10S	6/1/2011	12.25	12.25	585.53	PVC	2	7.73	577.80	-	0-2	2-5	5-12.25	7.25-12.25	5	-	-	Flushmount
PMW-11D	6/1/2011	12	24	585.76	open borehole	4	8.61	577.15	0-14	0-14	-	-	14-24	10	-	-	Flushmount
PMW-11S	5/23/2011	12.25	12.25	585.71	PVC	2	7.29	578.42	-	0-2	2-5	5-12.25	7.25-12.25	5	-	-	Flushmount
PMW-12D	1/18/2011	13	25	585.87	open borehole	4	8.72	577.15	0-15.2	0-15.2	-	-	15-25	10	-	-	Flushmount
PMW-13D	1/18/2011	12	24	585.68	open borehole	4	8.01	577.67	0-15	0-15	-	-	14-24	10	-	-	Flushmount
PMW-14D	1/18/2011	12	25	585.79	open borehole	4	8.32	577.47	0-15	0-15	-	-	14-25	11	-	-	Flushmount
PMW-15D	1/19/2011	11.5	24	585.63	open borehole	4	8.59	577.04	0-15	0-15	-	-	13.5-24	10.5	-	-	Flushmount
PMW-16D	1/17/2011	12	25	585.49	open borehole	4	8.42	577.07	0-15	0-15	-	-	14-25	11	-	-	Flushmount
PMW-17D	1/17/2011	12	24	585.77	open borehole	4	8.62	577.15	0-15	0-15	-	-	14-24	10	-	-	Flushmount
RMW- 1D	10/24/2003	15	30	585.93	Steel	2	8.39	577.54	0-17	0-15	15-17	17-30	18-28	10	28-30	2	Flushmount
RMW- 2D (2)	10/27/2003	13	32.5	586.14	Steel	2	7.88	578.26	0-15	0-13	13-15	15-32.5	17-27	10	27-29	2	Flushmount
RMW- 3D	10/24/2003	13.5	30	586.01	Steel	2	8.98	577.03	0-15.5	0-13	13-16	16-30	17.5-27.5	10	27.5-29.5	2	Flushmount
RMW- 4D	10/24/2003	12.5	30	585.76	Steel	2	8.88	576.88	0-14.5	0-14.5	14.5-15.5	15.5-30	16.5-26.5	10	26.5-30	3.5	Flushmount
TP- 1	-	-	-	-	PVC	3	6.48	-	-	-	-	-	-	-	-	-	Stickup
TP- 2	-	-	-	-	PVC	3	6.64	-	-	-	-	-	-	-	-	-	Stickup

Notes:

(1) MW-13S and MW-22D are new wells installed as part of the 2020 Remedial Investigation.
(2) Well not set at total depth of boring due to difficulty in drilling.
(3) MW-13S and MW-22D depth to groundwater measurements and groundwater elevations from 10/2/2020.
(4) Open borehole infromation listed instead of screen length where applicable.
AMSL - Above Mean Sea Level
ft bgs - feet below ground surface
 - No Data

Table 3-1

Sampling Matrix for BCP Program Parameters
2020 Remedial Investigation
Ekonol Polyester Resins BCP Site
Wheatfield, New York

	Parameters														
	Soils[5]							Groundwater							
Location [1][2]	VOCs (8260C)	SVOCs (8270D)	PFAS (537)	1,4-Dioxane (8270D SIM)	PCBs (8082A)	Pesticides (8081A)	Metals (6010C & 7471B)	VOCs [2] (8260C)	SVOCs (8270D)	PFAS (537)	1,4-Dioxane (8270D SIM)	PCBs (8082A)	Pesticides (8081A)	Total Metals (6010C & 7470A)	Dissolved Metals [2] (6010C & 7470A)
SB2020-01/MW-13S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SB2020-02	1	1	1	1	1	1	1								
SB2020-03	2	2	2	2	2	2	2								
SB2020-04	1	1	1	1	1	1	1								
SB2020-05	2	1	1	1	1	1	1								
SB2020-06 / MW-22D	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SB2020-07	2	1	1	1	1	1	1								
SB2020-08	2	1	1	1	1	1	1								
SB2020-09	1	1	1	1	1	1	1								
INJ-8D								1	1	1	1	1	1	1	1
MW-3S								1	1	1	1	1	1	1	1
MW-4S								1	1	1	1	1	1	1	1
MW-10S								1	1	1	1	1	1	1	-
PMW-1S								1	1	1	1	1	1	1	1
PMW-1D								1	1	1	1	1	1	1	1
PMW-10S								1	1	1	1	1	1	1	1
PMW-11D								1	1	1	1	1	1	1	1
RMW-3D								1	1	1	1	1	1	1	1
RMW-4D								1	1	1	1	1	1	1	1
Monitoring Subtotal	13	10	10	10	10	10	10	12	12	12	12	12	12	12	11
QA/QC															
Duplicates [3]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Matrix Spike [3]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Matrix Spike Duplicate [3]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Trip Blanks								4							
Rinse Blank [4]	1	1	4	1	1	1	1	1	1	7	1	1	1	1	1
Total Per Sampling Event	17	14	17	14	14	14	14	20	16	22	16	16	16	16	15

Notes:

(1) Listed Wells were sampled for BCP program parameters.
(2) Well locations that received the full BCP sampling list also received Plume Status Analyses. VOCs and Dissolved Metals are on both sample lists. (See Table 3-2).
(3) Duplicates, Matrix Spike, and Matrix Spike Duplicate samples will be collected at a rate of 1 per 20 samples.
(4) Rinse Blanks were taken on a basis of 1 per week per media with the exception of emerging contaminants which were taken on a basis of 1 per day.
(5) a. Surface Soil samples were not collected due to asphalt pavement covering the site.
b. One Subsurface Soil sample was collected from the interval above water table exhibiting greatest indication of contamination. If no visible sign of contamination was present, sample was collected from interval directly above the water table.
c. A second subsurface soil sample was collected for VOC-only analysis from the saturated zone if observations (elevated PID readings, odor, or staining) indicated potentially greater VOC impacts in the soil below the water table.
d. If both historical fill material and native material were present in a soil boring, a sample from each type of material was collected.

MW - monitoring well
SB- soil boring
QA/QC - quality assurance/quality control

VOC - volatile organic compound
SVOC - semi-volatile organic compound
PFAS - per-and polyfluoroalkyl substances
PCB - polychlorinated biphenyls

Table 3-2

Sampling Matrix for VOC Plume Status Monitoring
2020 Remedial Investigation
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Location	Synoptic Water Level Measurement(8)	VOCs (1)(9) (SW8260C)	Methane, Ethane, Ethene (RSK SOP-175 Modified)(2)	Dissolved Inorganics (3)(4)(9) (6010C)	Total Organic Carbon (SW9060A)	Well Head Analyses (5)	Sulfate (300.0)	Sulfide (SM 4500-S2)	Microbial Population(6) (CENSUS)	Mobile Lab Analyses (Hach kits) (7)
Overburden Bioreactor Monitoring Wells										
OR-4SM	1	1	1	1	1	1	1	1		1
OR-6SM	1	1	1	1	1	1	1	1	1	1
OR-10SM	1	1	1	1	1	1	1	1		1
OR-14SM	1	1	1	1	1	1	1	1	1	1
OR-18SM	1	1	1	1	1	1	1	1		1
PMW-1S (9)	1	1	1	1	1	1	1	1	1	1
PMW-3S	1	1	1	1	1	1	1	1	1	1
PMW-4S	1	1	1	1	1	1	1	1		1
PMW-6S	1	1	1	1	1	1	1	1		1
PMW-10S (9)	1	1	1	1	1	1	1	1	1	1
Bedrock Injection/Withdrawal Wells										
INJ-7D	1	1	1	1	1	1	1	1	1	1
INJ-8D (9)	1	1	1	1	1	1	1	1		1
INJ-11D	1	1	1	1	1	1	1	1		1
INJ-13D	1	1	1	1	1	1	1	1		1
Bedrock Monitoring Wells										
PMW-9D	1	1	1	1	1	1	1	1		1
PMW-10D	1	1	1	1	1	1	1	1		1
PMW-11D (9)	1	1	1	1	1	1	1	1	1	1
PMW-16D	1	1	1	1	1	1	1	1		1
PMW-17D	1	1	1	1	1	1	1	1	1	1
Pilot Test Wells										
PMW-1D (9)	1	1	1	1	1	1	1	1		1
PMW-2D	1	1	1	1	1	1	1	1	1	1
PMW-6D	1	1	1	1	1	1	1	1	1	1
RMW-4D (9)	1	1	1	1	1	1	1	1		1
PMW-8D	1	1	1	1	1	1	1	1		1
MW-7D	1	1	1	1	1	1	1	1		1
Site Investigation Wells										
MW-2S	1	1	1	1	1	1	1	1	1	1
MW-3S (9)	1	1	1	1	1	1	1	1		1
MW-4S (9)	1	1	1	1	1	1	1	1		1
MW-10S (9)	1	1	1	1		1				1
MW-11S	1	1	1			1				1
MW-12S	1	1	1			1				1
MW-13S (9)	1	1	1	1	1	1	1	1		1
RMW-2D	1	1	1	1	1	1	1	1	1	1
RMW-3D (9)	1	1	1	1	1	1	1	1		1
MW-11D	1	1	1			1				1
MW-17D	1	1	1			1				1
MW-20D	1	1	1			1				1
MW-21D	1	1	1			1				1
MW-22D (9)	1	1	1	1	1	1	1	1		1
Investigative Monitoring Wells										
MW-15D	1	1	1	1	1	1	1	1		1
MW-19D	1	1	1	1	1	1	1	1		1
MW-13D	1	1	1	1	1	1	1	1		1
MW-9S	1	1	1	1	1	1	1	1		1
Monitoring Subtotal	43	43	43	37	36	43	36	36	12	43
QA/QC										
Duplicates (10)		3	3	2	2		2	2		
Matrix Spike (11)		3	3	2	2		2	2		
Matix Spike Duplicate (11)		3	3	2	2		2	2		
Trip Blanks		8								
Total per sampling Event:		60	52	43	42	43	42	42	12	43

Notes:
(1) VOCs = volatile organic compounds, including aromatic and chlorinated aliphatic hydrocarbons.
(2) Analytical method for dissolved gases was a laboratory-specific standard operating procedure (RSK-175).
(3) All metal and cation samples were field filtered and immediately preserved (Fe, K).
(4) Dissolved inorganic compounds consisted of iron (Fe) and potassium (K). Samples were field filtered.
(5) Well head analyses included dissolved oxygen, oxidation-reduction potential, pH, temperature, electrical conductivity, turbidity and visual appearance.
(6) Analysis of microbial population composition included concentration measurements of *Dehalococcoides* (DHC) and *Dehalobacte* r (DHB) species in cells per milliliter as well as DHC functional genes.
(7) Field analyses included alkalinity, carbon dioxide, hydrogen sulfide, and ferrous iron.
(8) All Site water levels were recorded. MW-13S and MW-22D were recorded prior to sampling after they were drilled and developed.
(9) Indicates well locations in the plume status monitoring list that also received the full BCP sampling list, which includes an expanded list of VOCs, and total and dissolved metals, plus other analyses for the BCP (See Table 3-1).
(10) Field duplicates were collected at a rate of 1 per 20 samples. Field Duplicates were named FD-GW-MMDDYY and notated on the field sheet of the well where the duplicate was collected.
(11) Matrix spike/matrix spike duplicate pair collected at the rate of 1 per 20 samples.

Table 3-3

Water Level Measurements - September 8, 2020
2020 Remedial Investigation
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Well ID	Elevation Top of Casing	Easting	Northing	9/8/2020[1] Depth to Water (ft btoc)	Groundwater Elevation
INJ-01	585.70	1056172.53	1132217.92	8.41	577.29
INJ-02	585.54	1056179.53	1132230.81	8.42	577.12
INJ-03	585.35	1056164.47	1132230.97	7.60	577.75
INJ-04	585.58	1056185.83	1132211.60	7.88	577.70
INJ-05	585.60	1056159.24	1132212.19	7.22	578.38
INJ-06D	585.67	1056256.92	1132295.04	8.21	577.46
INJ-07D	585.89	1056227.95	1132328.21	8.42	577.47
INJ-08D	585.85	1056283.56	1132319.81	8.55	577.30
INJ-09D	585.74	1056236.21	1132260.58	7.99	577.75
INJ-10D	585.24	1056280.55	1132262.71	7.84	577.40
INJ-11D	585.76	1056185.26	1132328.88	8.52	577.24
INJ-12D	585.59	1056193.71	1132261.54	8.42	577.17
INJ-13D	585.78	1056199.78	1132296.96	8.53	577.25
MW-1S	585.06	1056192.71	1132468.53	6.34	578.72
MW-2S	585.11	1056254.14	1132311.92	2.50	582.61
MW-3S	584.83	1056317.60	1132228.17	6.25	578.58
MW-4S	585.79	1056183.51	1132220.46	7.19	578.60
MW-5S	585.66	1056429.00	1132454.91	8.06	577.60
MW-6S	585.64	1056266.92	1132123.45	7.12	578.52
MW-7S	586.46	1056161.35	1132148.61	7.02	579.44
MW-7D	585.87	1056173.63	1132156.49	9.08	576.79
MW-8S	586.19	1056062.61	1132192.87	5.85	580.34
MW-9S	586.10	1056094.38	1132273.82	6.68	579.42
MW-10S	585.77	1056442.61	1132303.24	7.19	578.58
MW-10D	585.47	1055990.20	1132241.44	8.42	577.05
MW-11S	586.00	1056372.98	1132005.83	8.18	577.82
MW-11D	588.42	1056434.68	1132119.94	11.31	577.11
MW-12S	586.11	1056235.49	1132057.93	8.77	577.34
MW-12D	585.85	1055849.97	1132286.53	8.92	576.93
MW-13S	585.81	1056167.71	1132298.53	8.87	576.94
MW-13D	587.89	1056401.65	1131373.46	11.78	576.11
MW-14D	587.70	1056477.88	1132399.34	10.41	577.29
MW-15D	585.76	1055873.33	1131333.59	9.70	576.06
MW-16D	586.96	1056393.84	1131176.05	12.68	574.28
MW-17D	587.31	1056444.40	1131980.99	10.30	577.01
MW-18D	587.07	1056621.36	1132083.84	9.87	577.20
MW-19D	585.44	1055674.08	1131339.31	8.80	576.64
MW-20D	586.17	1056045.44	1131530.44	9.25	576.92
MW-21D	585.90	1055862.75	1131532.09	9.33	576.57
MW-22D	585.63	1056422.68	1132272.68	8.53	577.10
OR-1SI	585.80	1056211.28	1132307.96	2.80	583.00
OR-2SI	585.61	1056221.00	1132286.30	5.03	580.58
OR-3SM	585.81	1056238.75	1132303.07	3.12	582.69
OR-4SM	585.70	1056237.61	1132286.58	5.04	580.66
OR-5SM	585.73	1056264.58	1132305.39	2.89	582.84
OR-6SM	585.74	1056264.08	1132285.79	8.31	577.43
OR-7SI	585.76	1056281.74	1132304.69	2.82	582.94
OR-8SI	585.70	1056281.88	1132285.61	8.32	577.38
OR-9SM	585.69	1056317.88	1132305.78	8.13	577.56
OR-10SM	585.57	1056322.03	1132285.34	8.11	577.46
OR-11SI	585.91	1056339.81	1132305.64	8.23	577.68
OR-12SI	585.63	1056340.88	1132285.72	8.16	577.47

Table 3-3

Water Level Measurements - September 8, 2020
2020 Remedial Investigation
Ekonol Polyester Resins BCP Site
Wheatfield, New York

	Elevation			9/8/2020 (1)	
	Top of			Depth to Water	Groundwater
OR-13SM	585.80	1056357.56	1132303.89	8.22	577.58
OR-14SM	585.68	1056359.10	1132284.59	8.33	577.35
OR-15SM	585.85	1056405.58	1132304.29	7.22	578.63
OR-16SI	585.74	1056408.53	1132289.87	7.55	578.19
OR-17SI	585.74	1056407.40	1132314.38	7.29	578.45
OR-18SM	585.51	1056425.90	1132308.77	7.20	578.31
PMW-1S	586.01	1056275.66	1132313.81	2.85	583.16
PMW-1D	585.66	1056173.74	1132291.16	8.27	577.39
PMW-2S	585.75	1056264.68	1132299.07	3.93	581.82
PMW-2D	585.85	1056180.62	1132220.74	8.78	577.07
PMW-3S	585.67	1056264.01	1132279.87	8.20	577.47
PMW-3D	585.98	1056172.04	1132210.57	8.72	577.26
PMW-4S	585.48	1056260.67	1132263.59	6.95	578.53
PMW-4D	585.73	1056156.77	1132199.23	8.61	577.12
PMW-5S	585.84	1056236.26	1132295.37	3.47	582.37
PMW-5D	585.73	1056200.45	1132209.88	8.74	576.99
PMW-6S	585.57	1056236.48	1132279.64	7.71	577.86
PMW-6D	585.86	1056187.65	1132197.91	8.90	576.96
PMW-7S	585.62	1056318.31	1132297.88	8.08	577.54
PMW-7D	585.82	1056171.23	1132181.82	8.95	576.87
PMW-8S	585.64	1056319.11	1132277.98	8.29	577.35
PMW-8D	585.46	1056158.56	1132222.87	4.61	580.85
PMW-9S	585.76	1056358.19	1132295.53	8.38	577.38
PMW-9D	585.92	1056208.44	1132275.49	8.20	577.72
PMW-10S	585.53	1056359.62	1132277.02	7.73	577.80
PMW-10D	585.68	1056257.10	1132275.14	8.15	577.53
PMW-11S	585.71	1056413.36	1132305.16	7.29	578.42
PMW-11D	585.76	1056311.43	1132273.20	8.61	577.15
PMW-12D	585.87	1056205.69	1132244.92	8.72	577.15
PMW-13D	585.68	1056235.09	1132247.22	8.01	577.67
PMW-14D	585.79	1056257.22	1132247.18	8.32	577.47
PMW-15D	585.63	1056279.65	1132246.82	8.59	577.04
PMW-16D	585.49	1056232.42	1132218.93	8.42	577.07
PMW-17D	585.77	1056255.43	1132226.60	8.62	577.15
RMW-1D	585.93	1056171.00	1132461.00	8.39	577.54
RMW-2D	586.14	1056235.00	1132291.00	7.88	578.26
RMW-3D	586.01	1056302.00	1132214.00	8.98	577.03
RMW-4D	585.76	1056171.69	1132203.28	8.88	576.88
TP-1	NA	NA	NA	6.48	NA
TP-2	NA	NA	NA	6.64	NA

Notes:

(1) MW-13S and MW-22D were installed on September 23, 2020 and September 24, 2020 respectively. The listed water levels and elevations were collected on October 2, 2020, prior to groundwater sampling .

ft btoc - feet below top of casing

NA - not applicable

Table 3-4

Well Condition Observations and Headspace Readings - September 8-9, 2020
2020 Remedial Investigation
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Well ID	CO (ppm)	H_2S (ppm)	Oxygen (%)	LEL (%)	VOCs (ppm)	Well Condition
INJ-01	0	0	20.9	0	1.0	Good
INJ-02	49	0	20.9	4	5.0	Good
INJ-03	13	7.8	20.9	0	0.8	Good
INJ-04	14	0	20.9	3	0.9	Good
INJ-05	177	0	20.9	5	15.9	Good
INJ-06D	10	0	20.9	0	0.0	Good
INJ-07D	0	0	20.9	0	0.0	Good
INJ-08D	34	0	19.0	14	0.2	Good
INJ-09D	0	0	20.9	5	0.1	Good
INJ-10D	5	0	16.6	25	0.1	Good
INJ-11D	0	0	14.5	0	0.1	Good
INJ-12D	0	0	19.2	5	0.0	Good
INJ-13D	160	0	16.9	65	3.1	Good
MW-1S	0	0	14.2	0	0.1	Good
MW-2S	0	0	20.9	0	3.4	Good
MW-3S	79	0	1.5	10	29.2	Good
MW-4S	0	0	20.9	0	0.6	Good
MW-5S	0	0	20.9	0	0.0	Good
MW-6S	0	0	15.7	0	0.3	Good
MW-7S	0	0	20.3	0	0.0	Good
MW-7D	74	0	16.2	25	4.4	Good
MW-8S	0	0	20.9	0	0.0	Good
MW-9S	0	0	20.9	0	0.5	Good
MW-10S	0	0	20.9	0	1.7	Good
MW-10D	0	0	17.9	0	0.0	Good
MW-11S	0	0	20.9	0	0.0	Good
MW-11D	5	0	20.9	0	0.0	Good
MW-12S	11	0	18.3	5	17.1	Good
MW-12D	0	0	20.9	0	0.1	Good
MW-13S	-	-	-	-	6.5[(1)]	New
MW-13D	0	0	20.9	0	0.0	Good
MW-14D	4	0	20.9	0	0.0	Good
MW-15D	0	0	20.9	0	0.0	Good
MW-16D	0	0	20.9	0	0.0	Good
MW-17D	0	0	20.9	0	0.0	Good
MW-18D	0	0	20.9	0	0.0	Good
MW-19D	0	0	20.9	0	0.0	Good
MW-20D	0	0	20.9	0	0.7	Good
MW-21D	0	0	20.9	0	0.0	Good
MW-22D	-	-	-	-	0.5	New
OR-1SI	0	0	20.9	0	0.0	Good
OR-2SI	0	0	20.9	0	0.0	Good
OR-3SM	0	0	11.0	99	0.1	Good
OR-4SM	0	0	20.9	0	0.4	Good
OR-5SM	0	99	20.9	6	10.0	Good
OR-6SM	499	99	12.2	99	24.4	Good
OR-7SI	6	2.3	20.9	99	0.1	Good
OR-8SI	50	99	20.9	35	27.8	Good
OR-9SM	15	3.2	21.3	0	14.2	Good
OR-10SM	0	99	20.9	99	7.2	Good
OR-11SI	0	0	20.9	0	0.0	Good
OR-12SI	0	99	10.2	99	1.1	Good
OR-13SM	0	0	18.3	99	0.7	Good
OR-14SM	0	0	19.5	0	0.0	Good
OR-15SM	0	0	20.9	0	0.0	Good
OR-16SI	0	99	16.0	99	3.3	Good
OR-17SI	0	99	14.3	99	0.4	Good

Table 3-4

Well Condition Observations and Headspace Readings - September 8-9, 2020
2020 Remedial Investigation
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Well ID	CO (ppm)	H_2S (ppm)	Oxygen (%)	LEL (%)	VOCs (ppm)	Well Condition
OR-18SM	3	0	20.9	0	2.5	Good
PMW-1S	0	0	20.9	0	0	Good
PMW-1D	0	0	17.5	99	0.1	Good
PMW-2S	0	0	20.9	0	0	Good
PMW-2D	230	0	19.7	27	17.3	Good
PMW-3S	0	0	20.9	0	3.8	Good
PMW-3D	35	>99	15.2	5	10.3	Good
PMW-4S	0	0	20.9	0	2.8	Good
PMW-4D	32	0	20.0	34	1.2	Good
PMW-5S	0	0	15.4	27	3.6	Good
PMW-5D	489	0	20.9	4	19.0	Good
PMW-6S	0	0	20.9	0	0.0	Good
PMW-6D	262	0	17.1	99	2.3	Good
PMW-7S	0	0	17.5	0	0.1	Good
PMW-7D	1	0	20.9	0	0	Good
PMW-8S	0	0	20.9	0	0	Good
PMW-8D	33	10.3	20.9	0	75.8	Good
PMW-9S	0	0	20.9	0	41.0	Good
PMW-9D	0	0	19.8	5	0.4	Good
PMW-10S	0	0	20.9	0	0	Good
PMW-10D	150	0	18.1	39	9.1	Good
PMW-11S	0	0	20.9	0	15.1	Good
PMW-11D	0	0	16.3	0	2.5	Good
PMW-12D	0	0	20.9	0	0.0	Good
PMW-13D	10	0	18.7	21	0.7	Good
PMW-14D	0	0	19.0	7	0.0	Good
PMW-15D	0	0	18.7	0	1.7	Good
PMW-16D	0	0	20.9	0	0.0	Good
PMW-17D	0	0	20.9	0	0.0	Good
RMW-1D	0	0	20.9	0	0.0	Good
RMW-2D	60	80.6	18.9	0	49.6	Good
RMW-3D	24	0	12.3	4	17.3	Good
RMW-4D	32	0	13.8	99	0.2	Good
TP-1	2	0	20.9	0	0.0	Good
TP-2	0	0	20.9	0	0.0	Good

Notes: Shaded values indicate detections by the 4-gas and VOC meters.
CO - carbon dioxide
H_2S - hydrogen sulfide
ppm - parts per million
LEL - lower explosive limit
VOCs - volitile organic compounds
(1) Wells MW-13S and MW-22D were installed on September 23, 2020 and September 24, 2020 respectively. There are no 4-gas data for these locations. VOCs headspace readings from October 2, 2020 prior to groundwater sampling at this locations.

Table 3-5

Analytical Specifications - Sample Bottle, Volume, Preservation, and Holding Time Summary
2020 Remedial Investigation
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Matrix/Analysis	Sample Prep Method (1)	Analytical Method (1)	Sample Bottles (2) Mat'l	Sample Bottles (2) Size	Sample Bottles (2) Qty	Sample Bottles (2) Source	Minimum Vol Rqd	Preservation (3)	Holding Time (4) Extraction	Holding Time (4) Analysis	Comment
Aqueous Samples											
Volatile Organics	SW-846 5030C	SW-846 8260C	Glass	40 mL	3	Lab	40 mL	HCl to pH ≤ 2	NA	14 days	7 days if not preserved.
Semivolatile Organics	SW-846 3510C	SW-846 8270D	Glass	250 mL	2	Lab	250 mL	None	7 days	40 days	
Pesticides	SW-846 3510C	SW-846 8081A/B	Glass	250 mL	2	Lab	250 mL	None	7 days	40 days	
PCBs	SW-846 3510C	SW-846 8082A	Glass	250 mL	2	Lab	250 mL	None	365 days	40 days	
Metals (except mercury)	SW-846 3005A	SW-846 6010D	Plastic	250 mL	1	Lab	200 mL	HNO_3 to pH≤ 2	NA	180 days	180 days for TAL metals except Hg.
Mercury	SW-846 7470A	SW-846 7470A							NA	28 days	28 days for Hg.
Dissolved Metals (except mercury)	SW-846 3005A	SW-846 6010C/6020A	Plastic	250 mL	1	Lab	200 mL	HNO_3 to pH≤ 2	NA	180 days	except Hg.
Dissolved Mercury	SW-846 7470A	SW-846 7470A							NA	28 days	28 days for Hg.
21 PFAS Compounds	EPA Method 537 Modified Iso Dil	EPA Method 537 Modified Iso Dil	HDPE	250 mL	2	Lab	250 mL	None	14 days	28 days	
1,4-Dioxane	SW-846 3546	SW-846 8270D SIM	Glass	1 L	2	Lab	1,000 mL	None	7 days	40 days	
Methane, Ethane, Ethane	RSK SOP-175 MOD	RSK SOP-175 MOD	Glass	40 mL	2	Lab	40 ml	HCl to pH ≤ 2	NA	14 days	
Total Organic Carbon	SW-846 9060A	SW-846 9060A	Glass	250 mL	1	Lab	150 ml	H_2SO4 to pH <2	NA	28 days	
Sulfate	EPA 300.0	EPA 300.0	HDPE	125 mL	1	Lab	50 ml	None	NA	28 days	
Sulfide	SM 4500-S2 F	SM 4500-S2 F	HDPE	125 mL	1	Lab	50 ml	$ZnAc_2$ and NaOH	NA	7 days	
Microbial Population	CENSUS qPCR	CENSUS qPCR	HDPE	1 L	1	Lab	1,000 mL	None	NA	24-48 hrs.	
pH	SW-846 9040C	SW-846 9040C	HDPE	125 mL	1	Lab	125 mL	None	NA	Immediately	field parameter
Non-Aqueous Samples											
Volatile Organics	SW-846 5035A	SW-846 8260C	Terracore	5 or 25 g	3 or 1	Vendor (6)	5 g	None	NA	48 hours (7)	
Semivolatile Organics	SW-846 3540C	SW-846 8270D	Glass	8 oz (5)	1	Lab	30 g	None	14 days	40 days	
Pesticides	SW-846 3540C	SW-846 8081A	Glass			Lab	30 g	None	14 days	40 days	
PCBs	SW-846 3540C	SW-846 8082A	Glass			Lab	30 g	None	365 days	40 days	
Metals (except mercury)	SW-846 3050B	SW-846 6010C	Glass			Lab	10 g	None	NA	180 days	except Hg.
Mercury	SW-846 7471A	SW-846 7471A					2 g		NA	28 days	28 days for Hg.
21 PFAS Compounds	EPA Method 537 Modified Iso Dil	EPA Method 537 Modified Iso Dil	HDPE	8 oz	1	Lab	15 g	None	14 days	28 days	
1,4-Dioxane	SW-846 3546	SW-846 8270D SIM	Glass	4 oz	1	Lab	15 g	None	14 days	40 days	
Air Samples											
Volatile Organics	NA	EPA TO-15 (8)	Stainless Steel	6 L	1	Lab	400 mL	None	NA	30 days	Summa canister; certified clean by laboratory.

Notes:
(1) More recent versions of SW-846, EPA, and SM methods may be used subject to AECOM approval.
(2) Bottles typical. Terracore samplers for VOCs in soil were provided by laboratory or AECOM on a case-by-case basis.
(3) All samples for chemical analysis were held at 4 degrees C in addition to any chemical preservation required.
(4) Holding time calculated from day of collection, unless noted as being from time of extraction. Laboratory holding times (ASP 2005, Exhibit I) are two days shorter to allow for field handling and shipping.
(5) A single 8-oz sample is sufficient for SVOCs, pesticides, PCBs, and metals.
(6) Terracore samplers are typically purchased from an outside supplier by AECOM but may also be requested (for a fee) from the analytical laboratory.
(7) Terracore samplers must be prepared/preserved in the laboratory within 48 hours of collection. Soil samples in glass bottles and preserved Terracores have a 14 day (total) holding time.
(8) A reporting limit of 0.25 $\mu g/m^3$ is required for NYSDOH Matrix 1 compounds (TCE, vinyl chloride, and carbon tetrachloride) in indoor air and outdoor (ambient) air samples.
SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. USEPA SW-846. Complete through Update IV, March 2009.
EPA - Compendium of Methods for the Determination of Toxic Organics in Air, Second Edition (EPA/625/R-96/010b; 1999).
SM - Standard Methods for the Examination of Water and Wastewater. AWWA. 20th Edition, 1998.

Table 5-1

BCP Subsurface Soil Analytical Results Summary
2020 Remedial Investigation
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Parameter	Unrestricted Use Criteria[1]	Protection of Groundwater Criteria[1]	Industrial Use Criteria[1]	SB2020-01 (5'-6')	SB2020-02 (9'-9.5')	SB2020-03 (3'-5')	SB2020-03 (10'-11')	SB2020-03 (10'-11', DUP)	SB2020-04 (7'-9')	SB2020-05 (5'-6')	SB2020-05 (10'-11')	SB2020-06 (5'-6')	SB2020-07 (5'-6')	SB2020-07 (11.2'-12.2')	SB2020-08 (7'-8')	SB2020-08 (11.8'-12.8')	SB2020-09 (5'-6')
Volatile Organic Compounds																	
Tetrachloroethene (µg/kg)	1300	1300	300000	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
Trichloroethene (µg/kg)	470	470	400000	4.3 U	25000	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
1,2-Dichloroethene (cis) (µg/kg)	250	250	1000000	4.3 U	6600	1200	240000	290000	3700	4800	1300	26	4.3 U	28	1700	330	1.2 J
1,2-Dichloroethene (trans) (µg/kg)	190	190	1000000	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	210 J	210 U	2.7 J	4.3 U	0.68 J	150 J	200 U	5.0 U
1,1-Dichloroethene (µg/kg)	330	330	1000000	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
Vinyl chloride (µg/kg)	20	20	27000	4.3 U	1000 U	280 U	6500 U	11000 U	1600	280 U	210 U	10	4.3 U	3.0 J	290 U	200 U	5.0 U
1,1,1-Trichloroethane (µg/kg)	680	680	1000000	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
1,1-Dichloroethane (µg/kg)	270	270	480000	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
Chloroethane (µg/kg)	1900	1900	--	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
Benzene (µg/kg)	60	60	89000	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
Ethylbenzene (µg/kg)	1000	1000	780000	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.4 UJ	4.4 U	290 U	200 U	5.0 U
Toluene (µg/kg)	700	700	1000000	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
Xylene (total) (µg/kg)	260	1600	1000000	8.5 U	2000 U	570 U	13000 U	22000 U	570 U	560 U	430 U	9.3 U	8.6 U	8.8 U	580 U	410 U	9.9 U
1,1,2,2-Tetrachloroethane (µg/kg)	600	600	--	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (µg/kg)	6000	6000	--	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
1,1,2-Trichloroethane (µg/kg)	--	--	--	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
1,2,4-Trichlorobenzene (µg/kg)	3400	3400	--	4.3 U	1000 U	280 U	6500 U	11000 U	180 J	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
1,2-Dibromo-3-chloropropane (µg/kg)	--	--	--	8.5 UJ	2000 U	570 U	13000 U	22000 U	570 U	560 U	430 U	9.3 U	8.6 U	8.8 U	580 U	410 U	9.9 U
1,2-Dibromoethane (Ethylene dibromide) (µg/kg)	--	--	--	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
1,2-Dichlorobenzene (µg/kg)	1100	1100	1000000	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
1,2-Dichloroethane (µg/kg)	20	20	60000	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
1,2-Dichloropropane (µg/kg)	700000	--	--	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
1,3-Dichlorobenzene (µg/kg)	2400	2400	560000	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
1,3-Dichloropropene (cis) (µg/kg)	--	--	--	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
1,3-Dichloropropene (trans) (µg/kg)	--	--	--	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
1,4-Dichlorobenzene (µg/kg)	1800	1800	250000	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
2-Hexanone (µg/kg)	--	--	--	17 U	4000 U	1100 U	26000 U	44000 U	1100 U	1100 U	850 U	19 U	17 U	18 U	1200 U	820 U	20 U
4-Methyl-2-pentanone (µg/kg)	1000	1000	--	17 U	4000 U	1100 U	26000 U	44000 U	1100 U	1100 U	850 U	19 U	17 U	18 U	1200 U	820 U	20 U
Acetone (µg/kg)	50	50	1000000	39	4000 U	1100 U	26000 U	44000 U	1100 U	1100 U	850 U	45	22 U	50	1200 U	820 U	27
Bromodichloromethane (µg/kg)	--	--	--	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
Bromoform (µg/kg)	--	--	--	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
Bromomethane (µg/kg)	--	--	--	4.3 UJ	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 UJ	4.3 UJ	4.4 U	290 U	200 U	5.0 UJ
Carbon disulfide (µg/kg)	2700	2700	--	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
Carbon tetrachloride (µg/kg)	760	760	44000	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
Chlorobenzene (µg/kg)	1100	1100	1000000	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
Chloroform (µg/kg)	370	370	700000	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
Chloromethane (µg/kg)	--	--	--	4.3 UJ	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
Cyclohexane (µg/kg)	--	--	--	8.5 U	2000 U	570 U	13000 U	22000 U	570 U	560 U	430 U	1.6 J	8.6 U	8.8 U	580 U	410 U	9.9 U
Dibromochloromethane (µg/kg)	10000	--	--	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
Dichlorodifluoromethane (µg/kg)	--	--	--	4.3 UJ	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 UJ	4.3 U	4.4 U	290 U	200 U	5.0 UJ
Isopropylbenzene (Cumene) (µg/kg)	2300	2300	--	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
Methyl acetate (µg/kg)	--	--	--	21 U	5100 U	1400 U	32000 U	55000 U	1400 U	1400 U	1100 U	23 U	22 U	22 U	1400 U	1000 U	25 U
Methyl ethyl ketone (2-Butanone) (µg/kg)	120	120	1000000	17 U	4000 U	280 J	26000 U	44000 U	260 J	190 J	210 J	19 U	17 U	18 U	200 J	170 J	20 U
Methyl tert-butyl ether (µg/kg)	930	930	1000000	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
Methylcyclohexane (µg/kg)	--	--	--	8.5 U	2000 U	570 U	13000 U	22000 U	570 U	560 U	430 U	1.1 J	8.6 U	8.8 U	580 U	410 U	9.9 U
Methylene chloride (µg/kg)	50	50	1000000	21 U	2000 U	570 U	13000 U	22000 U	570 U	560 U	430 U	23 U	22 U	22 U	580 U	410 U	25 U
Styrene (µg/kg)	300000	--	--	4.3 U	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U
Trichlorofluoromethane (µg/kg)	--	--	--	4.3 UJ	1000 U	280 U	6500 U	11000 U	280 U	280 U	210 U	4.7 U	4.3 U	4.4 U	290 U	200 U	5.0 U

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Semi Volatile Organic Compounds																	
1,1-Biphenyl (µg/kg)	60000	--	--	61 U	62 U	30 J	1600	1800	200 J	60 U	NA	60 U	61 U	NA	61 U	NA	61 U
2,2-oxybis(1-Chloropropane) (µg/kg)	--	--	--	120 U	120 U	120 U	130 U	270 U	500 U	120 U	NA	120 U	120 U	NA	120 U	NA	120 U
2,4,5-Trichlorophenol (µg/kg)	100	100	--	180 U	180 U	180 U	200 U	400 U	760 U	180 U	NA	180 U	180 U	NA	180 U	NA	180 U
2,4,6-Trichlorophenol (µg/kg)	10000	--	--	180 U	180 U	180 U	200 U	400 U	760 U	180 U	NA	180 U	180 U	NA	180 U	NA	180 U
2,4-Dichlorophenol (µg/kg)	400	400	--	180 U	180 U	180 U	200 U	400 U	760 U	180 U	NA	180 U	180 U	NA	180 U	NA	180 U
2,4-Dimethylphenol (µg/kg)	--	--	--	180 U	180 U	180 U	200 U	400 U	760 U	180 U	NA	180 U	180 U	NA	180 U	NA	180 U
2,4-Dinitrophenol (µg/kg)	200	200	--	400 U	410 U	400 U	440 U	880 U	R	400 U	NA	400 U	400 U	NA	410 U	NA	400 U
2,4-Dinitrotoluene (µg/kg)	--	--	--	250 U	250 U	240 U	260 U	530 U	1000 U	240 U	NA	240 U	240 U	NA	250 U	NA	240 U
2,6-Dinitrotoluene (µg/kg)	170	170	--	250 U	250 U	240 U	260 U	530 U	1000 U	240 U	NA	240 U	240 U	NA	250 U	NA	240 U
2-Chloronaphthalene (µg/kg)	--	--	--	61 U	62 U	61 U	66 U	130 U	250 U	60 U	NA	60 U	61 U	NA	61 U	NA	61 U
2-Chlorophenol (µg/kg)	800	--	--	61 U	62 U	61 U	66 U	130 U	250 U	60 U	NA	60 U	61 U	NA	61 U	NA	61 U
2-Methylnaphthalene (µg/kg)	410	36400	--	18 U	18 U	18 U	20 U	40 U	76 U	18 U	NA	18 U	18 U	NA	18 U	NA	18 U
2-Methylphenol (o-cresol) (µg/kg)	330	330	1000	250 U	250 U	240 U	260 U	530 U	1000 U	240 U	NA	240 U	240 U	NA	250 U	NA	240 U
2-Nitroaniline (µg/kg)	400	400	--	250 U	250 U	240 U	260 U	530 U	1000 U	240 U	NA	240 U	240 U	NA	250 U	NA	240 U
2-Nitrophenol (µg/kg)	300	300	--	61 U	62 U	61 U	66 U	130 U	250 U	60 U	NA	60 U	61 U	NA	61 U	NA	61 U
3&4-Methylphenol (µg/kg)	--	--	--	490 U	490 U	490 U	530 U	1100 U	2000 U	480 U	NA	480 U	490 U	NA	490 U	NA	490 U
3,3-Dichlorobenzidine (µg/kg)	--	--	--	120 U	120 U	120 U	130 U	270 U	500 U	120 U	NA	120 U	120 U	NA	120 U	NA	120 U
3-Nitroaniline (µg/kg)	500	500	--	250 U	250 U	240 U	260 U	530 U	1000 U	240 U	NA	240 U	240 U	NA	250 U	NA	240 U
4,6-Dinitro-2-methylphenol (µg/kg)	--	--	--	400 U	410 U	400 U	440 U	880 U	1700 U	400 U	NA	400 U	400 U	NA	410 U	NA	400 U
4-Bromophenyl-phenylether (µg/kg)	--	--	--	61 U	62 U	61 U	66 U	130 U	250 U	60 U	NA	60 U	61 U	NA	61 U	NA	61 U
4-Chloro-3-methylphenol (µg/kg)	--	--	--	180 U	180 U	180 U	200 U	400 U	760 U	180 U	NA	180 U	180 U	NA	180 U	NA	180 U
4-Chloroaniline (µg/kg)	220	220	--	180 U	180 U	180 U	200 U	400 U	760 U	180 U	NA	180 U	180 U	NA	180 U	NA	180 U
4-Chlorophenyl-phenylether (µg/kg)	--	--	--	61 U	62 U	61 U	66 U	130 U	250 U	60 U	NA	60 U	61 U	NA	61 U	NA	61 U
4-Nitroaniline (µg/kg)	--	--	--	250 U	250 U	240 U	260 U	530 U	1000 U	240 U	NA	240 U	240 U	NA	250 U	NA	240 U
4-Nitrophenol (µg/kg)	100	100	--	400 U	410 U	400 U	440 U	880 U	1700 U	400 U	NA	400 U	400 U	NA	410 U	NA	400 U
Acenaphthene (µg/kg)	20000	98000	1000	18 U	18 U	18 U	20 U	40 U	76 U	18 U	NA	18 U	18 U	NA	18 U	NA	18 U
Acenaphthylene (µg/kg)	100000	107000	1000	18 U	18 U	18 U	20 U	40 U	76 U	18 U	NA	18 U	18 U	NA	18 U	NA	18 U
Acetophenone (µg/kg)	--	--	--	120 U	120 U	120 U	31 J	44 J	500 U	120 U	NA	120 U	120 U	NA	120 U	NA	120 U
Anthracene (µg/kg)	100000	1000000	1000	18 U	18 U	18 U	20 U	40 U	76 U	18 U	NA	18 U	18 U	NA	18 U	NA	18 U
Atrazine (µg/kg)	--	--	--	250 U	250 U	240 U	260 U	530 U	1000 U	240 U	NA	240 U	240 U	NA	250 U	NA	240 U
Benzaldehyde (µg/kg)	--	--	--	120 U	120 U	120 U	130 U	270 U	500 U	120 U	NA	120 U	120 U	NA	120 U	NA	120 U
Benzo(a)anthracene (µg/kg)	1000	1000	11	18 U	18 U	18 U	20 U	40 U	76 U	18 U	NA	18 U	18 U	NA	18 U	NA	18 U
Benzo(a)pyrene (µg/kg)	1000	22000	1.1	18 U	18 U	18 U	20 U	40 U	76 U	18 U	NA	18 U	18 U	NA	18 U	NA	18 U
Benzo(b)fluoranthene (µg/kg)	1000	1700	11	18 U	18 U	18 U	20 U	40 U	76 U	18 U	NA	18 U	18 U	NA	18 U	NA	18 U
Benzo(g,h,i)perylene (µg/kg)	100000	1000000	1000	18 U	18 U	18 U	20 U	40 U	76 U	18 U	NA	18 U	18 U	NA	18 U	NA	18 U
Benzo(k)fluoranthene (µg/kg)	800	1700	110	18 U	18 U	18 U	20 U	40 U	76 U	18 U	NA	18 U	18 U	NA	18 U	NA	18 U
bis(2-Chloroethoxy)methane (µg/kg)	--	--	--	120 U	120 U	120 U	130 U	270 U	500 U	120 U	NA	120 U	120 U	NA	120 U	NA	120 U
bis(2-Chloroethyl)ether (µg/kg)	--	--	--	120 U	120 U	120 U	130 U	270 U	500 U	120 U	NA	120 U	120 U	NA	120 U	NA	120 U
bis(2-Ethylhexyl)phthalate (µg/kg)	50000	435000	--	86 U	86 U	86 U	92 U	190 U	350 U	84 U	NA	84 U	86 U	NA	86 U	NA	85 U
Butylbenzylphthalate (µg/kg)	100000	122000	--	86 U	86 U	86 U	92 U	190 U	350 U	84 U	NA	84 U	86 U	NA	86 U	NA	85 U
Caprolactam (µg/kg)	--	--	--	400 U	410 U	400 U	440 U	880 U	1700 U	400 U	NA	400 U	400 U	NA	410 U	NA	400 U
Carbazole (µg/kg)	--	--	--	61 U	62 U	61 U	66 U	130 U	250 U	60 U	NA	60 U	61 U	NA	61 U	NA	61 U
Chrysene (µg/kg)	1000	1000	110	5.8 J	14 J	4.6 J	20 U	40 U	76 U	6.1 J	NA	18 U	18 U	NA	18 U	NA	9.2 J
Dibenz(a,h)anthracene (µg/kg)	330	1000000	1.1	18 U	18 U	18 U	20 U	40 U	76 U	18 U	NA	18 U	18 U	NA	18 U	NA	18 U
Dibenzofuran (µg/kg)	7000	210000	1000	61 U	62 U	61 U	66 U	130 U	250 U	60 U	NA	60 U	61 U	NA	61 U	NA	61 U
Diethylphthalate (µg/kg)	7100	7100	--	86 U	86 U	86 U	92 U	190 U	350 U	84 U	NA	84 U	86 U	NA	86 U	NA	85 U
Dimethylphthalate (µg/kg)	27000	27000	--	86 U	86 U	86 U	92 U	190 U	350 U	84 U	NA	84 U	86 U	NA	86 U	NA	85 U
Di-n-butylphthalate (µg/kg)	14	8100	--	86 U	86 U	86 U	92 U	190 U	350 U	84 U	NA	84 U	86 U	NA	86 U	NA	85 U
Di-n-octylphthalate (µg/kg)	100000	120000	--	86 U	86 U	86 U	92 U	190 U	350 U	84 U	NA	84 U	86 U	NA	86 U	NA	85 U

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Fluoranthene (µg/kg)	100000	1000000	1000	18 U	18 U	18 U	20 U	40 U	76 U	18 U	NA	18 U	18 U	NA	18 U	NA	18 U
Fluorene (µg/kg)	30000	386000	1000	18 U	18 U	18 U	20 U	40 U	25 J	18 U	NA	18 U	18 U	NA	18 U	NA	18 U
Hexachlorobenzene (µg/kg)	330	3200	12	18 U	18 U	18 U	20 U	40 U	76 U	18 U	NA	18 U	18 U	NA	18 U	NA	18 U
Hexachlorobutadiene (µg/kg)	--	--	--	61 U	62 U	61 U	66 U	130 U	250 U	60 U	NA	60 U	61 U	NA	61 U	NA	61 U
Hexachlorocyclopentadiene (µg/kg)	10000	--	--	400 UJ	410 U	400 U	440 U	880 U	R	400 UJ	NA	400 UJ	400 UJ	NA	410 UJ	NA	400 UJ
Hexachloroethane (µg/kg)	--	--	--	61 U	62 U	61 U	66 U	130 U	250 U	60 U	NA	60 U	61 U	NA	61 U	NA	61 U
Indeno(1,2,3-cd)pyrene (µg/kg)	500	8200	11	18 U	18 U	18 U	20 U	40 U	76 U	18 U	NA	18 U	18 U	NA	18 U	NA	18 U
Isophorone (µg/kg)	4400	4400	--	61 U	62 U	61 U	66 U	130 U	250 U	60 U	NA	60 U	61 U	NA	61 U	NA	61 U
Naphthalene (µg/kg)	12000	12000	1000	18 U	18 U	18 U	12 J	13 J	76 U	18 U	NA	18 U	18 U	NA	18 U	NA	18 U
Nitrobenzene (µg/kg)	170	170	140	120 U	120 U	120 U	130 U	270 U	500 U	120 U	NA	120 U	120 U	NA	120 U	NA	120 U
N-Nitroso-di-n-propylamine (µg/kg)	--	--	--	61 U	62 U	61 U	66 U	130 U	250 U	60 U	NA	60 U	61 U	NA	61 U	NA	61 U
N-Nitrosodiphenylamine (µg/kg)	20000	--	--	61 U	62 U	61 U	66 U	130 U	250 U	60 U	NA	60 U	61 U	NA	61 U	NA	61 U
Pentachlorophenol (µg/kg)	800	800	55	180 U	180 U	180 U	200 U	400 U	760 U	180 U	NA	180 U	180 U	NA	180 U	NA	180 U
Phenanthrene (µg/kg)	100000	1000000	1000	18 U	9.5 J	18 U	7.6 J	40 U	76 U	18 U	NA	18 U	18 U	NA	18 U	NA	18 U
Phenol (µg/kg)	330	330	1000	61 U	62 U	61 U	78	120 J	40 J	60 U	NA	60 U	61 U	NA	61 U	NA	61 U
Pyrene (µg/kg)	100000	1000000	1000	18 U	9.3 J	18 U	7.3 J	11 J	76 U	18 U	NA	18 U	18 U	NA	18 U	NA	4.1 J
Metals																	
Aluminum, Total (mg/kg)	10000	--	--	12000	17000	17000	15000	15000	14000	16000	NA	13000	18000	NA	14000	NA	14000
Antimony, Total (mg/kg)	12	--	--	2.1 U	2.0 U	2.3 U	2.3 U	2.0 U	2.3 UJ	2.4 U	NA	1.8 U	2.2 U	NA	1.9 U	NA	1.8 U
Arsenic, Total (mg/kg)	13	16	16	2.3	3.5	5.2	4.5	4.5	3.9	4.9	NA	4.6	2.0	NA	5.1	NA	3.6
Barium, Total (mg/kg)	350	820	10000	87	210	260	130	100	110	96	NA	97	130	NA	91	NA	110
Beryllium, Total (mg/kg)	7.2	47	2700	0.69	0.83	0.96	0.78	0.79	0.75	0.82	NA	0.67	0.88	NA	0.70	NA	0.70
Cadmium, Total (mg/kg)	2.5	7.5	60	0.53 U	0.22 J	0.26 J	0.26 J	0.24 J	0.24 J	0.61 U	NA	0.45 U	0.56 U	NA	0.47 U	NA	0.45 U
Calcium, Total (mg/kg)	10000	--	--	64000	45000	73000	44000	36000	44000 J	49000	NA	39000	39000	NA	43000	NA	50000
Chromium, Total (mg/kg)	30	--	6800	18	24	24	22	23	20 J	23	NA	19	25	NA	20	NA	20
Cobalt, Total (mg/kg)	20	--	--	9.1	16	17	14	15	16	13	NA	10	13	NA	13	NA	15
Copper, Total (mg/kg)	50	1720	10000	17	19	21	22	22	20 J	20	NA	17	17	NA	17	NA	18
Iron, Total (mg/kg)	2000	--	--	20000	25000	28000	25000	26000	23000 J	27000	NA	21000	26000	NA	23000	NA	22000
Lead, Total (mg/kg)	63	450	3900	5.4	7.8	8.4	9.3	9.5	8.4 J	7.6	NA	6.5	7.6	NA	6.9	NA	7.1
Magnesium, Total (mg/kg)	--	--	--	11000	11000	11000	13000	12000	13000 J	12000	NA	11000	13000	NA	11000	NA	10000
Manganese, Total (mg/kg)	1600	2000	10000	420	540	610	500	470	490 J	490	NA	390	460	NA	470	NA	480
Mercury, Total (mg/kg)	0.180	0.73	5.7	0.13 U	0.13 U	0.14 U	0.14 U	0.13 U	0.11 U	0.12 U	NA	0.11 U	0.12 U	NA	0.12 U	NA	0.13 U
Nickel, Total (mg/kg)	30	130	10000	26	35	37	34	36	34	34	NA	29	36	NA	32	NA	32
Potassium, Total (mg/kg)	--	--	--	2500	3500	2500	3100	3000	2800	3500	NA	2700	3700	NA	3000	NA	2800
Selenium, Total (mg/kg)	3.9	4	6800	2.1 U	2.0 U	2.3 U	2.3 U	2.0 U	2.3 U	2.4 U	NA	1.8 U	2.2 U	NA	1.9 U	NA	1.8 U
Silver, Total (mg/kg)	2	8.3	6800	1.1 U	1.0 U	1.2 U	1.1 U	1.0 U	1.1 U	1.2 U	NA	0.89 U	1.1 U	NA	0.93 U	NA	0.89 U
Sodium, Total (mg/kg)	--	--	--	230 J	280 J	440 J	430 J	420 J	430 J	230 J	NA	160 J	250 J	NA	640	NA	200 J
Thallium, Total (mg/kg)	5	--	--	2.1 U	0.59 J	2.3 U	0.72 J	0.76 J	2.3 U	2.4 U	NA	1.8 U	2.2 U	NA	1.9 U	NA	1.8 U
Vanadium, Total (mg/kg)	39	--	--	24	30	31	30	30	28	33	NA	26	31	NA	27	NA	28
Zinc, Total (mg/kg)	109	2480	10000	58	74	69	72	78	74	69	NA	63	77	NA	70	NA	62
PCBs																	
Aroclor 1016 (µg/kg)	100	3200	25000	65 U	64 U	58 U	66 U	64 U	65 U	63 U	NA	58 U	61 U	NA	60 U	NA	60 U
Aroclor 1221 (µg/kg)	--	--	--	65 U	64 U	58 U	66 U	64 U	65 U	63 U	NA	58 U	61 U	NA	60 U	NA	60 U
Aroclor 1232 (µg/kg)	100	3200	25000	65 U	64 U	58 U	66 U	64 U	65 U	63 U	NA	58 U	61 U	NA	60 U	NA	60 U
Aroclor 1242 (µg/kg)	100	3200	25000	65 U	64 U	58 U	66 U	64 U	65 U	63 U	NA	58 U	61 U	NA	60 U	NA	60 U
Aroclor 1248 (µg/kg)	100	3200	25000	65 U	64 U	58 U	66 U	64 U	65 U	63 U	NA	58 U	61 U	NA	60 U	NA	60 U
Aroclor 1254 (µg/kg)	100	3200	25000	65 U	64 U	43 J	66 U	64 U	65 U	63 U	NA	58 U	61 U	NA	60 U	NA	60 U
Aroclor 1260 (µg/kg)	100	3200	25000	65 U	64 U	58 U	66 U	64 U	65 U	63 U	NA	58 U	61 U	NA	60 U	NA	60 U
Aroclor 1262 (µg/kg)	100	3200	25000	65 U	64 U	58 U	66 U	64 U	65 U	63 U	NA	58 U	61 U	NA	60 U	NA	60 U
Aroclor 1268 (µg/kg)	100	3200	25000	65 U	64 U	58 U	66 U	64 U	65 U	63 U	NA	58 U	61 U	NA	60 U	NA	60 U

Table 5-1

BCP Subsurface Soil Analytical Results Summary
2020 Remedial Investigation
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Parameter	Unrestricted Use Criteria[1]	Protection of Groundwater Criteria[1]	Industrial Use Criteria[1]	SB2020-01 (5'-6')	SB2020-02 (9'-9.5')	SB2020-03 (3'-5')	SB2020-03 (10'-11')	SB2020-03 (10'-11', DUP)	SB2020-04 (7'-9')	SB2020-05 (5'-6')	SB2020-05 (10'-11')	SB2020-06 (5'-6')	SB2020-07 (5'-6')	SB2020-07 (11.2'-12.2')	SB2020-08 (7'-8')	SB2020-08 (11.8'-12.8')	SB2020-09 (5'-6')
Pesticides																	
4,4'-DDD (µg/kg)	3.3	14000	180000	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
4,4'-DDE (µg/kg)	3.3	17000	120000	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
4,4'-DDT (µg/kg)	3.3	136000	94000	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
Aldrin (µg/kg)	5	190	1400	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
alpha-BHC (µg/kg)	20	20	6800	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
alpha-Chlordane (µg/kg)	94	2900	47000	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
beta-BHC (µg/kg)	36	90	14000	6.2 U	6.8 NJ	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	10 NJ	NA	5.9 U	NA	5.9 U
delta-BHC (µg/kg)	40	250	1000000	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
Dieldrin (µg/kg)	5	100	2800	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
Endosulfan I (µg/kg)	2400	102000	920000	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
Endosulfan II (µg/kg)	2400	102000	920000	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
Endosulfan sulfate (µg/kg)	2400	1000000	920000	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
Endrin (µg/kg)	14	60	410000	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
Endrin aldehyde (µg/kg)	--	--	--	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
Endrin ketone (µg/kg)	--	--	--	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
gamma-BHC (Lindane) (µg/kg)	100	100	23000	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
gamma-Chlordane (µg/kg)	540	14000	--	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
Heptachlor (µg/kg)	42	380	29000	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
Heptachlor epoxide (µg/kg)	20	20	--	6.2 U	6.0 U	29 U	6.7 U	6.3 U	31 U	5.9 U	NA	6.0 U	6.2 U	NA	5.9 U	NA	5.9 U
Methoxychlor (µg/kg)	1200	900000	--	12 U	12 U	58 U	13 U	13 U	61 U	12 U	NA	12 U	12 U	NA	12 U	NA	12 U
Toxaphene (µg/kg)	--	--	--	120 U	120 U	580 U	130 U	130 U	610 U	120 U	NA	120 U	120 U	NA	120 U	NA	120 U

Notes:
1. 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, Protection of Groundwater, Industrial Use, plus CP-51 Table 1 10/21/10.
2. See Table 5-2 emergent contaminant sampling analyses for 1,4-Dioxane and PFAS soil results.
3. Detection Limits shown are PQL

PQL - practical quantitation limit
µg/kg - micrograms per killogram
mg/g - milligrams per killogram
s.u. - standard units
NA - Not Analyzed
-- no criteria

BOLD = Exceeds Unrestricted Use Criteria
[boxed] = Exceeds Protection of Groundwater Criteria
[grey shading] = Exceeds Industial Use Criteria
[orange shading] = Ekonol-Specific Groundwater Plume Monitoring List

J - The reported concentration is an estimated value.
U - Not detected above the method detection limit.
UJ - Not detected. The reporting limit is an estimated value.
R - Value is Rejected
D - Result reported from a secondary dilution analysis
NJ - tentative identification

Table 5-2

Subsurface Soil Analytical Result Summary
Emerging Contaminant Sampling Analyses - 2020 RI
Ekonol Polyester Resins BCP Site
Wheatfield, New York

					Location Name	SB2020-01	SB2020-02	SB2020-03	SB2020-03	SB2020-03	SB2020-04
					Sample Name	SB2020-01-5-6	SB2020-02-9-9.5	SB2020-03-3-5	SB2020-03-10-11	FD-092120	SB2020-04-7-9
					Sample Date	9/24/2020	9/21/2020	9/21/2020	9/21/2020	9/21/2020	9/21/2020
					Parent Sample					SB2020-03-10-11	
Analyte	Units	CAS No.	Unrestricted Use Criteria[1]	Protection of Groundwater Criteria[1]	Industrial Use Criteria[1]						
SW846-8270D SIM											
1,4-Dioxane	µg/kg	123-91-1	100	100	250000	1.0 J	3.8	2.5	5.3	4.0	5.4
PFAS - EPA 537 Modified											
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/g	2991-50-6	NE	NE	NE	2.4 U	2.3 U	2.3 U	2.5 U	2.6 U	2.3 U
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/g	2355-31-9	NE	NE	NE	2.4 U	2.3 U	2.3 U	2.5 U	2.6 U	2.3 U
Perfluorobutanesulfonic acid (PFBS)	ng/g	375-73-5	NE	NE	NE	2.4 U	2.3 U	2.3 U	2.5 U	2.6 U	2.3 U
Perfluorobutanoic acid (PFBA)	ng/g	375-22-4	NE	NE	NE	2.4 U	2.3 U	2.3 U	2.5 U	2.6 U	2.3 U
Perfluorodecanesulfonic acid (PFDS)	ng/g	335-77-3	NE	NE	NE	0.73 U	0.7 U	0.68 U	0.75 U	0.77 U	0.69 U
Perfluorodecanoic acid (PFDA)	ng/g	335-76-2	NE	NE	NE	0.73 U	0.7 U	0.68 U	0.75 U	0.77 U	0.69 U
Perfluorododecanoic acid(PFDoA)	ng/g	307-55-1	NE	NE	NE	0.73 U	0.7 U	0.68 U	0.75 U	0.77 U	0.69 U
Perfluoroheptanesulfonic Acid (PFHpS)	ng/g	375-92-8	NE	NE	NE	0.73 U	0.7 U	0.68 U	0.75 U	0.77 U	0.69 U
Perfluorohexanoic acid (PFHxA)	ng/g	307-24-4	NE	NE	NE	0.73 U	0.7 U	0.68 U	0.75 U	0.77 U	0.69 U
Perfluorooctanesulfonamide (PFOSA)	ng/g	754-91-6	NE	NE	NE	0.73 U	0.7 U	0.68 U	0.75 U	0.77 U	0.69 U
Perfluoropentanoic acid (PFPeA)	ng/g	2706-90-3	NE	NE	NE	0.73 U	0.7 U	0.68 U	0.75 U	0.77 U	0.69 U
Perfluorotetradecanoic acid (PFTeA)	ng/g	376-06-7	NE	NE	NE	0.73 U	0.7 U	0.68 U	0.75 U	0.77 U	0.69 U
Perfluoroheptanoic acid (PFHpA)	ng/g	375-85-9	NE	NE	NE	0.73 U	0.7 U	0.68 U	0.75 U	0.77 U	0.69 U
Perfluorotridecanoic acid (PFTriA)	ng/g	72629-94-8	NE	NE	NE	0.73 U	0.7 U	0.68 U	0.75 U	0.77 U	0.69 U
Perfluoroundecanoic acid (PFUnA)	ng/g	2058-94-8	NE	NE	NE	0.73 U	0.7 U	0.68 U	0.75 U	0.77 U	0.69 U
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ng/g	39108-34-4	NE	NE	NE	3.7 U	3.5 U	3.4 U	3.8 U	3.8 U	3.4 U
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ng/g	27619-97-2	NE	NE	NE	2.4 U	2.3 U	2.3 U	2.5 U	2.6 U	2.3 U
Perfluorohexanesulfonic acid (PFHxS)	ng/g	355-46-4	NE	NE	NE	0.73 U	0.7 U	0.68 U	0.75 U	0.77 U	0.69 U
Perfluorononanoic acid (PFNA)	ng/g	375-95-1	NE	NE	NE	0.73 U	0.7 U	0.68 U	0.75 U	0.77 U	0.69 U
Perfluorooctanesulfonic acid (PFOS)	ng/g	1763-23-1	0.88	3.7	440	0.73 U	0.7 U	0.68 U	0.75 U	0.77 U	0.69 U
Perfluorooctanoic acid (PFOA)	ng/g	335-67-1	0.66	1.1	600	0.73 U	0.7 U	0.68 U	0.75 U	0.77 U	0.69 U
Total NYSDEC Target PFAS List	ng/g	NA	NE	NE	NE	U	U	U	U	U	U
Total PFOS and PFOA	ng/g	NA	NE	NE	NE	U	U	U	U	U	U

See Page 2 of 2 for notes.

Table 5-2

Subsurface Soil Analytical Result Summary
Emerging Contaminant Sampling Analyses - 2020 RI
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Analyte	Units	CAS No.	Unrestricted Use Criteria[1]	Protection of Groundwater Criteria[1]	Industrial Use Criteria[1]	SB2020-05	SB2020-06	SB2020-07	SB2020-08	SB2020-09
Sample Name						SB2020-05-5-6	SB2020-06-5-6	SB2020-07-5-6	SB2020-08-7-8	SB2020-09-5-6
Sample Date						9/21/2020	9/22/2020	9/22/2020	9/22/2020	9/22/2020
Parent Sample										
SW846-8270D SIM										
1,4-Dioxane	µg/kg	123-91-1	100	100	250000	4.9	4.4	3.8	2.9	3.0
PFAS - EPA 537 Modified										
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/g	2991-50-6	NE	NE	NE	2.3 U	2.4 U	2.4 U	2.4 U	2.2 U
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/g	2355-31-9	NE	NE	NE	2.3 U	2.4 U	2.4 U	2.4 U	2.2 U
Perfluorobutanesulfonic acid (PFBS)	ng/g	375-73-5	NE	NE	NE	2.3 U	2.4 U	2.4 U	2.4 U	2.2 U
Perfluorobutanoic acid (PFBA)	ng/g	375-22-4	NE	NE	NE	2.3 U	2.4 U	2.4 U	2.4 U	2.2 U
Perfluorodecanesulfonic acid (PFDS)	ng/g	335-77-3	NE	NE	NE	0.7 U	0.72 U	0.71 U	0.71 U	0.67 U
Perfluorodecanoic acid (PFDA)	ng/g	335-76-2	NE	NE	NE	0.7 U	0.72 U	0.71 U	0.71 U	0.67 U
Perfluorododecanoic acid(PFDoA)	ng/g	307-55-1	NE	NE	NE	0.7 U	0.72 U	0.71 U	0.71 U	0.67 U
Perfluoroheptanesulfonic Acid (PFHpS)	ng/g	375-92-8	NE	NE	NE	0.7 U	0.72 U	0.71 U	0.71 U	0.67 U
Perfluorohexanoic acid (PFHxA)	ng/g	307-24-4	NE	NE	NE	0.7 U	0.72 U	0.71 U	0.71 U	0.67 U
Perfluorooctanesulfonamide (PFOSA)	ng/g	754-91-6	NE	NE	NE	0.7 U	0.72 U	0.71 U	0.71 U	0.67 U
Perfluoropentanoic acid (PFPeA)	ng/g	2706-90-3	NE	NE	NE	0.7 U	0.72 U	0.71 U	0.71 U	0.67 U
Perfluorotetradecanoic acid (PFTeA)	ng/g	376-06-7	NE	NE	NE	0.7 U	0.72 U	0.71 U	0.71 U	0.67 U
Perfluoroheptanoic acid (PFHpA)	ng/g	375-85-9	NE	NE	NE	0.7 U	0.72 U	0.71 U	0.71 U	0.67 U
Perfluorotridecanoic acid (PFTriA)	ng/g	72629-94-8	NE	NE	NE	0.7 U	0.72 U	0.71 U	0.71 U	0.67 U
Perfluoroundecanoic acid (PFUnA)	ng/g	2058-94-8	NE	NE	NE	0.7 U	0.72 U	0.71 U	0.71 U	0.67 U
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ng/g	39108-34-4	NE	NE	NE	3.5 U	3.6 U	3.6 U	3.6 U	3.3 U
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ng/g	27619-97-2	NE	NE	NE	2.3 U	2.4 U	2.4 U	2.4 U	2.2 U
Perfluorohexanesulfonic acid (PFHxS)	ng/g	355-46-4	NE	NE	NE	0.7 U	0.72 U	0.71 U	0.71 U	0.67 U
Perfluorononanoic acid (PFNA)	ng/g	375-95-1	NE	NE	NE	0.7 U	0.72 U	0.71 U	0.71 U	0.67 U
Perfluorooctanesulfonic acid (PFOS)	ng/g	1763-23-1	0.88	3.7	440	0.7 U	0.72 U	0.71 U	0.71 U	0.67 U
Perfluorooctanoic acid (PFOA)	ng/g	335-67-1	0.66	1.1	600	0.7 U	0.72 U	0.71 U	0.71 U	0.67 U
Total NYSDEC Target PFAS List	ng/g	NA	NE	NE	NE	U	U	U	U	U
Total PFOS and PFOA	ng/g	NA	NE	NE	NE	U	U	U	U	U

Notes:
Detected values are shown in bold.
Detection Limits shown are PQL.
bolded box = Exceedance of listed criteria.
µg/kg - micrograms per kilogram
ng/g - nanograms per gram
J - Result is less than the reporting limit (RL) but greater than or equal to the Method Detection Limit (MDL) and the concentration is an approximate value.
U - Not detected above the method detection limit.
NA - Not applicable
NS - No Sample
DW - Drinking Water
GW - Groundwater
MCL - Maximum Contaminant Level
NE - Not Established

Reference:
1. *SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) Under NYSDEC's Part 375 Remedial Programs.* NYSDEC, January, 2021.

Table 5-3

BCP Groundwater Analytical Result Summary - 2020 RI
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Parameter	Criteria[1]	INJ- 8D	MW- 3S	MW- 4S	MW-10S	MW-13S	MW-22D	PMW- 1D	PMW- 1S	PMW-10S	PMW-11D	PMW-11D (DUP)	RMW- 3D	RMW- 4D
Volatile Organic Compounds														
PCE (µg/L)	5	100 U	1.0 U	25 U	4.0 U	100 U	0.65 J	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
TCE (µg/L)	5	15 J	0.13 J	28	1.2 J	100 U	0.68 J	7300	1.7 J	0.13 J	48 J	49 J	100 U	500 U
Cis-1,2-DCE (µg/L)	5	2000	1.0 U	930	97	3200	2.0	180000	330	1.0 U	870	860	440	10000
Trans-1,2-DCE (µg/L)	5	28 J	1.0 U	13 J	4.0 U	22 J	1.0 U	5000 U	8.7 J	1.0 U	200 U	200 U	100 U	500 U
1,1-DCE (µg/L)	5	67 J	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	66 J	71 J	72 J	500 U
Vinyl Chloride (µg/L)	2	2400	1.0 U	1200	32	820	0.20 J	12000	160	26	120 J	140 J	130	3200
1,1,1-Trichloroethane (µg/L)	5	1000	1.0 U	25 U	4.0 U	100 U	4.8	5000 U	13 U	1.0 U	3700	3800	2200	500 U
1,1-Dichloroethane (µg/L)	5	600	1.0 U	25 U	4.0 U	100 U	1.4	5000 U	13 U	1.0 U	160 J	170 J	120	500 U
Chloroethane (µg/L)	5	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
Benzene (µg/L)	1	100 U	0.21 J	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
Ethylbenzene (µg/L)	5	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
Toluene (µg/L)	5	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
Xylene (total) (µg/L)	5	200 U	2.0 U	50 U	8.0 U	200 U	2.0 U	10000 U	1.9 J	2.0 U	400 U	400 U	200 U	1000 U
1,1,2,2-Tetrachloroethane (µg/L)	5	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
1,1,2-Trichloro-1,2,2-trifluoroethane (µg/L)	5	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
1,1,2-Trichloroethane (µg/L)	1	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
1,2,4-Trichlorobenzene (µg/L)	5	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
1,2-Dibromo-3-chloropropane (µg/L)	0.04	200 U	2.0 U	50 U	8.0 U	200 U	2.0 U	10000 U	25 U	2.0 U	400 U	400 U	200 U	1000 U
1,2-Dibromoethane (Ethylene dibromide) (µg/L)	0.006	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
1,2-Dichlorobenzene (µg/L)	3	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
1,2-Dichloroethane (µg/L)	0.6	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
1,2-Dichloropropane (µg/L)	1	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
1,3-Dichlorobenzene (µg/L)	3	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	2.2 J	1.0 U	200 U	200 U	100 U	500 U
1,3-Dichloropropene (cis) (µg/L)	0.4	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
1,3-Dichloropropene (trans) (µg/L)	0.4	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
1,4-Dichlorobenzene (µg/L)	3	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
2-Hexanone (µg/L)	50	1000 U	10 U	250 U	40 U	1000 U	10 U	50000 U	130 U	10 U	2000 U	2000 U	1000 U	5000 U
4-Methyl-2-pentanone (µg/L)	--	1000 U	10 U	250 U	40 U	1000 U	10 U	50000 U	130 U	10 U	2000 U	2000 U	1000 U	5000 U
Acetone (µg/L)	50	1000 U	10 U	250 U	40 U	1000 U	10 U	50000 U	130 U	10 U	2000 U	2000 U	1000 U	5000 U
Bromodichloromethane (µg/L)	50	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
Bromoform (µg/L)	50	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
Bromomethane (µg/L)	5	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 UJ	13 U	1.0 U	200 U	200 U	100 U	500 U
Carbon disulfide (µg/L)	60	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
Carbon tetrachloride (µg/L)	5	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
Chlorobenzene (µg/L)	5	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	0.15 J	200 U	200 U	100 U	500 U
Chloroform (µg/L)	7	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
Chloromethane (µg/L)	5	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
Cyclohexane (µg/L)	--	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
Dibromochloromethane (µg/L)	50	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
Dichlorodifluoromethane (µg/L)	5	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
Isopropylbenzene (Cumene) (µg/L)	5	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	1.3 J	1.0 U	200 U	200 U	100 U	500 U
Methyl acetate (µg/L)	--	1000 U	10 U	250 U	40 U	1000 U	10 U	50000 U	130 U	10 U	2000 U	2000 U	1000 U	5000 U
Methyl ethyl ketone (2-Butanone) (µg/L)	50	1000 U	10 U	32 J	40 U	1000 U	10 U	50000 U	130 U	10 U	2000 U	2000 U	1000 U	5000 U
Methyl tert-butyl ether (µg/L)	10	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U

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Methylcyclohexane (µg/L)	--	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
Methylene chloride (µg/L)	5	500 U	5.0 U	130 U	20 U	500 U	5.0 U	25000 U	63 U	5.0 U	1000 U	1000 U	500 U	2500 U
Styrene (µg/L)	5	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
Trichlorofluoromethane (µg/L)	5	100 U	1.0 U	25 U	4.0 U	100 U	1.0 U	5000 U	13 U	1.0 U	200 U	200 U	100 U	500 U
Semi Volatile Organic Compounds														
1,1-Biphenyl (µg/L)	5	32	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	63	4.4	1.0 U	12	11	2.2	37
2,2-oxybis(1-Chloropropane) (µg/L)	5	3.8 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	19 U	1.0 U	1.0 U	0.96 U	0.96 U	1.0 U	10 U
2,4,5-Trichlorophenol (µg/L)	1	19 U	5.2 U	6.0 U	5.2 U	5.2 U	5.0 U	96 U	5.2 U	5.2 U	4.8 U	4.8 U	5.2 U	50 U
2,4,6-Trichlorophenol (µg/L)	1	19 U	5.2 U	6.0 U	5.2 U	5.2 U	5.0 U	96 U	5.2 U	5.2 U	4.8 U	4.8 U	5.2 U	50 U
2,4-Dichlorophenol (µg/L)	5	7.7 U	2.1 U	2.4 U	2.1 U	2.1 U	2.0 U	38 U	2.1 U	2.1 U	1.9 U	1.9 U	2.1 U	20 U
2,4-Dimethylphenol (µg/L)	50	7.7 U	2.1 U	2.4 U	2.1 U	2.1 U	2.0 U	38 U	2.1 U	2.1 U	1.9 U	1.9 U	2.1 U	20 U
2,4-Dinitrophenol (µg/L)	10	38 U	10 U	12 U	10 U	10 U	10 U	190 U	10 U	10 U	9.6 U	9.6 U	10 U	100 U
2,4-Dinitrotoluene (µg/L)	5	19 U	5.2 U	6.0 U	5.2 U	5.2 U	5.0 U	96 U	5.2 U	5.2 U	4.8 U	4.8 U	5.2 U	50 U
2,6-Dinitrotoluene (µg/L)	5	19 U	5.2 U	6.0 U	5.2 U	5.2 U	5.0 U	96 U	5.2 U	5.2 U	4.8 U	4.8 U	5.2 U	50 U
2-Chloronaphthalene (µg/L)	10	3.8 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	19 U	1.0 U	1.0 U	0.96 U	0.96 U	1.0 U	10 U
2-Chlorophenol (µg/L)	1	3.8 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	19 U	1.0 U	1.0 U	0.96 U	0.96 U	1.0 U	10 U
2-Methylnaphthalene (µg/L)	--	0.77 U	0.21 U	0.24 U	0.21 U	0.21 U	0.20 U	3.8 U	0.21 U	0.21 U	0.19 U	0.19 U	0.21 U	2.0 U
2-Methylphenol (o-cresol) (µg/L)	1	38	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	2200 D	1.0 U	1.0 U	0.96 U	0.96 U	1.0 U	240
2-Nitroaniline (µg/L)	5	7.7 U	2.1 U	2.4 U	2.1 U	2.1 U	2.0 U	38 U	2.1 U	2.1 U	1.9 U	1.9 U	2.1 U	20 U
2-Nitrophenol (µg/L)	1	7.7 U	2.1 U	2.4 U	2.1 U	2.1 U	2.0 U	38 U	2.1 U	2.1 U	1.9 U	1.9 U	2.1 U	20 U
3&4-Methylphenol (µg/L)	1	18	2.1 U	2.4 U	2.1 U	2.1 U	2.0 U	91	2.1 U	2.1 U	1.9 U	1.9 U	2.1 U	49
3,3-Dichlorobenzidine (µg/L)	5	19 U	5.2 U	6.0 U	5.2 U	5.2 U	5.0 U	96 U	5.2 U	5.2 U	4.8 U	4.8 U	5.2 U	50 U
3-Nitroaniline (µg/L)	5	7.7 UJ	2.1 U	2.4 UJ	2.1 U	2.1 U	2.0 U	38 U	2.1 U	2.1 U	1.9 U	1.9 U	2.1 U	20 U
4,6-Dinitro-2-methylphenol (µg/L)	1	19 U	5.2 U	6.0 U	5.2 U	5.2 U	5.0 U	96 U	5.2 U	5.2 U	4.8 U	4.8 U	5.2 U	50 U
4-Bromophenyl-phenylether (µg/L)	50	7.7 U	2.1 U	2.4 U	2.1 U	2.1 U	2.0 U	38 U	2.1 U	2.1 U	1.9 U	1.9 U	2.1 U	20 U
4-Chloro-3-methylphenol (µg/L)	1	7.7 U	2.1 U	2.4 U	2.1 U	2.1 U	2.0 U	38 U	2.1 U	2.1 U	1.9 U	1.9 U	2.1 U	20 U
4-Chloroaniline (µg/L)	5	7.7 U	2.1 U	2.4 U	2.1 U	R	R	38 U	2.1 U	2.1 U	1.9 U	1.9 U	2.1 U	20 U
4-Chlorophenyl-phenylether (µg/L)	50	7.7 U	2.1 U	2.4 U	2.1 U	2.1 U	2.0 U	38 U	2.1 U	2.1 U	1.9 U	1.9 U	2.1 U	20 U
4-Nitroaniline (µg/L)	5	7.7 U	2.1 U	2.4 U	2.1 U	2.1 UJ	2.0 UJ	38 U	2.1 U	2.1 U	1.9 U	1.9 U	2.1 U	20 U
4-Nitrophenol (µg/L)	1	38 U	10 U	12 U	10 U	10 U	10 U	190 U	10 U	10 U	9.6 U	9.6 U	10 U	100 U
Acenaphthene (µg/L)	20	0.77 U	0.21 U	0.24 U	0.21 U	0.21 U	0.20 U	3.8 U	0.21 U	0.21 U	0.19 U	0.19 U	0.21 U	2.0 U
Acenaphthylene (µg/L)	50	0.77 U	0.21 U	0.24 U	0.21 U	0.21 U	0.20 U	3.8 U	0.21 U	0.21 U	0.19 U	0.19 U	0.21 U	2.0 U
Acetophenone (µg/L)	--	3.8 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	36	1.0 U	1.0 U	0.96 U	0.96 U	1.0 U	10 U
Anthracene (µg/L)	50	0.77 U	0.21 U	0.24 U	0.21 U	0.21 U	0.20 U	3.8 U	0.21 U	0.21 U	0.19 U	0.19 U	0.21 U	2.0 U
Atrazine (µg/L)	7.5	7.7 U	2.1 U	2.4 U	2.1 U	2.1 U	2.0 U	38 U	2.1 U	2.1 U	1.9 U	1.9 U	2.1 U	20 U
Benzaldehyde (µg/L)	--	7.7 UJ	2.1 U	2.4 UJ	2.1 U	2.1 U	2.0 U	38 U	2.1 U	2.1 U	1.9 U	1.9 U	2.1 U	20 U
Benzo(a)anthracene (µg/L)	0.002	0.77 U	0.21 U	0.24 U	0.21 U	0.21 U	0.20 U	3.8 U	0.21 U	0.21 U	0.19 U	0.19 U	0.21 U	2.0 U
Benzo(a)pyrene (µg/L)	0	0.77 U	0.21 U	0.24 U	0.21 U	0.21 U	0.20 U	3.8 U	0.21 U	0.21 U	0.19 U	0.19 U	0.21 U	2.0 U
Benzo(b)fluoranthene (µg/L)	0.002	0.77 U	0.21 U	0.24 U	0.21 U	0.21 U	0.20 U	3.8 U	0.21 U	0.38	0.19 U	0.19 U	0.21 U	2.0 U
Benzo(g,h,i)perylene (µg/L)	50	0.77 U	0.21 U	0.24 U	0.21 U	0.21 U	0.20 U	3.8 U	0.21 U	0.26	0.19 U	0.19 U	0.21 U	2.0 U
Benzo(k)fluoranthene (µg/L)	0.002	0.77 U	0.21 U	0.24 U	0.21 U	0.21 U	0.20 U	3.8 U	0.21 U	0.21 U	0.19 U	0.19 U	0.21 U	2.0 U
bis(2-Chloroethoxy)methane (µg/L)	5	3.8 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	19 U	1.0 U	1.0 U	0.96 U	0.96 U	1.0 U	10 U
bis(2-Chloroethyl)ether (µg/L)	1.0	3.8 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	19 U	1.0 U	1.0 U	0.96 U	0.96 U	1.0 U	10 U
bis(2-Ethylhexyl)phthalate (µg/L)	5	19 U	5.2 U	6.0 U	5.2 U	5.2 U	5.0 U	96 U	5.2 U	5.2 U	4.8 U	4.8 U	5.2 U	50 U
Butylbenzylphthalate (µg/L)	50	7.7 U	2.1 U	2.4 U	2.1 U	2.1 U	2.0 U	38 U	2.1 U	2.1 U	1.9 U	1.9 U	2.1 U	20 U

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Caprolactam (µg/L)	--	19 U	5.2 U	6.0 U	5.2 U	R	R	96 U	5.2 U	5.2 U	4.8 U	4.8 U	5.2 U	50 U
Carbazole (µg/L)	50	3.8 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	19 U	1.0 U	1.0 U	0.96 U	0.96 U	1.0 U	10 U
Chrysene (µg/L)	0.002	0.77 U	0.21 U	0.24 U	0.21 U	0.21 U	0.20 U	3.8 U	0.21 U	0.21 U	0.19 U	0.19 U	0.21 U	2.0 U
Dibenz(a,h)anthracene (µg/L)	50	0.77 U	0.21 U	0.24 U	0.21 U	0.21 U	0.20 U	3.8 U	0.21 U	0.21 U	0.19 U	0.19 U	0.21 U	2.0 U
Dibenzofuran (µg/L)	50	3.8 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	19 U	1.0 U	1.0 U	0.96 U	0.96 U	1.0 U	10 U
Diethylphthalate (µg/L)	50	19 U	5.2 U	6.0 U	5.2 U	5.2 U	5.0 U	96 U	5.2 U	5.2 U	4.8 U	4.8 U	5.2 U	62
Dimethylphthalate (µg/L)	50	7.7 U	2.1 U	2.4 U	2.1 U	2.1 U	2.0 U	38 U	2.1 U	2.1 U	1.9 U	1.9 U	2.1 U	20 U
Di-n-butylphthalate (µg/L)	50	19 U	5.2 U	6.0 U	5.2 U	5.2 U	5.0 U	96 U	5.2 U	5.2 U	4.8 U	4.8 U	5.2 U	50 U
Di-n-octylphthalate (µg/L)	50	7.7 U	2.1 U	2.4 U	2.1 U	2.1 U	2.0 U	38 U	2.1 U	2.1 U	1.9 U	1.9 U	2.1 U	20 U
Fluoranthene (µg/L)	50	0.77 U	0.21 U	0.24 U	0.26	0.21 U	0.20 U	3.8 U	0.21 U	0.56	0.19 U	0.19 U	0.21 U	2.0 U
Fluorene (µg/L)	50	0.77 U	0.21 U	0.24 U	0.21 U	0.21 U	0.20 U	3.8 U	0.21 U	0.21 U	0.19 U	0.19 U	0.25	2.0 U
Hexachlorobenzene (µg/L)	0.04	0.77 U	0.21 U	0.24 U	0.21 U	0.21 U	0.20 U	3.8 U	0.21 U	0.21 U	0.19 U	0.19 U	0.21 U	2.0 U
Hexachlorobutadiene (µg/L)	0.5	3.8 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	19 U	1.0 U	1.0 U	0.96 U	0.96 U	1.0 U	10 U
Hexachlorocyclopentadiene (µg/L)	5	38 U	10 U	12 U	10 U	10 U	10 U	190 U	10 U	10 U	9.6 U	9.6 U	10 U	100 U
Hexachloroethane (µg/L)	5	3.8 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	19 U	1.0 U	1.0 U	0.96 U	0.96 U	1.0 U	10 U
Indeno(1,2,3-cd)pyrene (µg/L)	0.002	0.77 U	0.21 U	0.24 U	0.21 U	0.21 U	0.20 U	3.8 U	0.21 U	0.21 U	0.19 U	0.19 U	0.21 U	2.0 U
Isophorone (µg/L)	50	3.8 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	19 U	1.0 U	1.0 U	0.96 U	0.96 U	1.0 U	10 U
Naphthalene (µg/L)	10	0.77 U	0.21 U	0.24 U	0.21 U	0.21 U	0.20 U	3.8 U	0.21 U	0.21 U	0.19 U	0.19 U	0.21 U	2.0 U
Nitrobenzene (µg/L)	0.4	3.8 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	19 U	1.0 U	1.0 U	0.96 U	0.96 U	1.0 U	10 U
N-Nitroso-di-n-propylamine (µg/L)	50	3.8 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	19 U	1.0 U	1.0 U	0.96 U	0.96 U	1.0 U	10 U
N-Nitrosodiphenylamine (µg/L)	50	3.8 U	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	19 U	1.0 U	1.0 U	0.96 U	0.96 U	1.0 U	10 U
Pentachlorophenol (µg/L)	1	38 U	10 U	12 U	10 U	10 U	10 U	190 U	10 U	10 U	9.6 U	9.6 U	10 U	100 U
Phenanthrene (µg/L)	50	0.77 U	0.21 U	0.24 U	0.21 U	0.21 U	0.20 U	3.8 U	0.21 U	0.21 U	0.28	0.28	0.28	2.0 U
Phenol (µg/L)	1	20	1.0 U	1.2 U	1.0 U	1.0 U	1.0 U	6000 D	1.0 U	1.0 U	2.0	1.3	1.0 U	40
Pyrene (µg/L)	50	0.77 U	0.21 U	0.24 U	0.21 U	0.21 U	0.20 U	3.8 U	0.21 U	0.39	0.19 U	0.19 U	0.21 U	2.0 U
Dissolved Metals														
Aluminum, Dissolved (µg/L)	--	50 U	50 U	50 U	50 U	50 U	50 U	50 U	39 J	50 U	50 U	50 U	50 U	50 U
Antimony, Dissolved (µg/L)	3	2 U	1.4 J	2 U	2 U	2 U	2 U	2 U	2 U	2.8	2 U	2 U	2 U	2 U
Arsenic, Dissolved (µg/L)	25	0.84 J	2.7 J	3.7 J	5 U	1.4 J	0.78 J	1.6 J	5 U	1.7 J	5 U	5 U	5 U	1.1 J
Barium, Dissolved (µg/L)	1000	370	41	10	5.1	48	29	170	530	13	33	33	40	430
Beryllium, Dissolved (µg/L)	3	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium, Dissolved (µg/L)	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Calcium, Dissolved (µg/L)	--	250000	210000	450000	290000	410000	230000	370000	230000	480000	210000	220000	220000	420000
Chromium, Dissolved (µg/L)	50	2 U	2 U	2 U	2 U	1 J	9.1	2 U	2.2	2 U	2 U	2 U	2 U	2 U
Cobalt, Dissolved (µg/L)	--	1 U	1.5	0.35 J	0.69 J	0.57 J	0.25 J	0.33 J	1	1.1	1 U	1 U	1 U	0.38 J
Copper, Dissolved (µg/L)	200	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2.9	2 U	2 U	2 U	2 U
Iron, Dissolved (µg/L)	300	110	1500	86 J	1900	1300	560	58 J	3700	100 U	1800	1700	110	100 U
Lead, Dissolved (µg/L)	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.7	1 U	1 U	1 U	1 U
Magnesium, Dissolved (µg/L)	35000	84000	180000	700000	120000	540000	95000	110000	42000	550000	68000	68000	66000	220000
Manganese, Dissolved (µg/L)	300	230	530	680	1300	470	190	360	460	130	160	160	130	280
Mercury, Dissolved (µg/L)	0.7	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel, Dissolved (µg/L)	100	2 U	6.5	2 U	1.7 J	2 U	1.7 J	2 U	2.1	3.8	2 U	2 U	2 U	1.5 J
Potassium, Dissolved (µg/L)	--	4900	13000	6500	2300	6500	3100	8100	10000	4700	2800	2800	2800	100 U
Selenium, Dissolved (µg/L)	10	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Silver, Dissolved (µg/L)	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

Table 5-3

BCP Groundwater Analytical Result Summary - 2020 RI
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Parameter	Criteria[1]	INJ- 8D	MW- 3S	MW- 4S	MW-10S	MW-13S	MW-22D	PMW- 1D	PMW- 1S	PMW-10S	PMW-11D	PMW-11D (DUP)	RMW- 3D	RMW- 4D
Sodium, Dissolved (µg/L)	20000	360000	2000000	300000	61000	280000	72000	640000	1200000	120000	71000	70000	64000	720000
Thallium, Dissolved (µg/L)	0.5	1 U	0.27 J	1 U	0.24 J	1 U	1 U	1 U	0.26 J	1 U	1 U	1 U	1 U	1 U
Vanadium, Dissolved (µg/L)	--	5 U	1.3 J	5 U	5 U	1.6 J	5 U	5 U	1.9 J	17	5 U	5 U	5 U	5 U
Zinc, Dissolved (µg/L)	2000	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	30	20 U	20 U	20 U	20 U
Metals														
Aluminum, Total (µg/L)	--	86	71	190	50 U	50 U	50 U	36 J	48 J	1700	50 U	50 U	50 U	280
Antimony, Total (µg/L)	3	2.0 U	1.3 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	3.4	2.0 U	2.0 U	2.0 U	2.0 U
Arsenic, Total (µg/L)	25	0.93 J	3.0 J	4.9 J	0.76 J	2.0 J	5.0 U	1.8 J	5.0 U	2.5 J	5.0 U	5.0 U	5.0 U	1.3 J
Barium, Total (µg/L)	1000	380	38	12	5.0	51	30	160	500	19	33	30	37	440
Beryllium, Total (µg/L)	3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cadmium, Total (µg/L)	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Calcium, Total (µg/L)	--	250000	210000	430000	290000	430000	230000	340000	210000	490000	200000	200000	210000	410000
Chromium, Total (µg/L)	50	2.0 U	2.0 U	1.0 J	2.0 U	2.0 U	2.0 U	1.0 J	1.8 J	1.6 J	2.0 U	2.0 U	1.8 J	15
Cobalt, Total (µg/L)	--	0.23 J	1.8	0.67 J	0.72 J	0.74 J	0.23 J	0.38 J	1.1	1.2	0.19 J	1.0 U	0.21 J	0.73 J
Copper, Total (µg/L)	200	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	4.4	2.0 U	2.0 U	2.0 U	2.0 U
Iron, Total (µg/L)	300	1800	1500	310	1900	1500	670	1100	3800	450	8700	7500	180	550
Lead, Total (µg/L)	25	0.82 J	1.0 U	1.1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.7	1.0 U	1.0 U	1.0 U	0.63 J
Magnesium, Total (µg/L)	35000	84000	170000	640000	130000	550000	94000	99000	39000	550000	68000	65000	63000	220000
Manganese, Total (µg/L)	300	230	560	640	1400	490	190	330	440	120	170	160	120	290
Mercury, Total (µg/L)	0.7	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Nickel, Total (µg/L)	100	2.0 U	8.4	6.4	1.8 J	1.8 J	2.0 U	2.0 U	2.3	5.3	2.0 U	2.0 U	2.1	16
Potassium, Total (µg/L)	--	4900	13000	7000	2200	6700	3000	7600	9500	4900	3300	3200	2700	6700
Selenium, Total (µg/L)	10	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Silver, Total (µg/L)	50	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Sodium, Total (µg/L)	20000	370000	2000000	340000	62000	280000	71000	590000	1100000	120000	100000	100000	61000	720000
Thallium, Total (µg/L)	0.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.22 J	1.0 U	1.0 U	1.0 U
Vanadium, Total (µg/L)	--	5.0 U	1.4 J	1.4 J	5.0 U	1.9 J	5.0 U	5.0 U	2.0 J	20	5.0 U	5.0 U	5.0 U	1.2 J
Zinc, Total (µg/L)	2000	76	20 U	20 U	20 U	20 U	17 J	20 U	20 U	63	130	110	20 U	20 U
PCBs														
Aroclor 1016 (µg/L)	0.09	0.99 U	0.11 U	0.11 U	0.10 U	0.099 U	0.10 U	0.11 U	0.10 U	0.10 U	0.096 U	0.096 U	0.095 U	0.10 U
Aroclor 1221 (µg/L)	0.09	0.99 U	0.11 U	0.11 U	0.10 U	0.099 U	0.10 U	0.11 U	0.10 U	0.10 U	0.096 U	0.096 U	0.095 U	0.10 U
Aroclor 1232 (µg/L)	0.09	0.99 U	0.11 U	0.11 U	0.10 U	0.099 U	0.10 U	0.11 U	0.10 U	0.10 U	0.096 U	0.096 U	0.095 U	0.10 U
Aroclor 1242 (µg/L)	0.09	0.99 U	0.11 U	0.11 U	0.10 U	0.099 U	0.10 U	0.11 U	0.10 U	0.10 U	0.096 U	0.096 U	0.095 U	0.10 U
Aroclor 1248 (µg/L)	0.09	0.99 U	0.11 U	0.11 U	0.10 U	0.099 U	0.10 U	0.11 U	0.10 U	0.10 U	0.096 U	0.096 U	0.095 U	0.10 U
Aroclor 1254 (µg/L)	0.09	0.46 J	0.11 U	0.11 U	0.10 U	0.099 U	0.10 U	0.11 U	0.10 U	0.10 U	0.096 U	0.096 U	0.095 U	0.10 U
Aroclor 1260 (µg/L)	0.09	0.99 U	0.11 U	0.11 U	0.10 U	0.099 U	0.10 U	0.11 U	0.10 U	0.10 U	0.096 U	0.096 U	0.095 U	0.10 U
Aroclor 1262 (µg/L)	0.09	0.99 U	0.11 U	0.11 U	0.10 U	0.099 U	0.10 U	0.11 U	0.10 U	0.10 U	0.096 U	0.096 U	0.095 U	0.10 U
Aroclor 1268 (µg/L)	--	0.99 U	0.11 U	0.11 U	0.10 U	0.099 U	0.10 U	0.11 U	0.10 U	0.10 U	0.096 U	0.096 U	0.095 U	0.10 U
Pesticides														
4,4'-DDD (µg/L)	0.3	0.25 U	0.052 U	0.24 U	0.052 U	5.0 U	0.052 U	9.7 U	5.0 U	0.051 U	4.8 U	4.8 U	5.0 U	5.0 U
4,4'-DDE (µg/L)	0.2	0.25 U	0.052 U	0.24 U	0.052 U	5.0 U	0.052 U	9.7 U	5.0 U	0.051 U	4.8 U	4.8 U	5.0 U	5.0 U
4,4'-DDT (µg/L)	0.2	0.25 U	0.052 U	0.24 U	0.052 U	5.0 U	0.052 U	9.7 U	5.0 U	0.051 U	4.8 U	4.8 U	5.0 U	5.0 U
Aldrin (µg/L)	0	0.25 U	0.052 U	0.24 U	0.052 U	5.0 U	0.052 U	9.7 U	0.050 U	0.051 U	0.048 U	0.048 U	5.0 U	5.0 U
alpha-BHC (µg/L)	0.01	0.25 U	0.052 U	0.24 U	0.052 U	5.0 U	0.052 U	9.7 U	5.0 U	0.051 U	4.8 U	4.8 U	5.0 U	5.0 U
alpha-Chlordane (µg/L)	0.05	0.25 U	0.052 U	0.24 U	0.052 U	5.0 U	0.052 U	9.7 U	0.050 U	0.051 U	0.048 U	0.048 U	5.0 U	5.0 U

Table 5-3

BCP Groundwater Analytical Result Summary - 2020 RI
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Parameter	Criteria[1]	INJ- 8D	MW- 3S	MW- 4S	MW-10S	MW-13S	MW-22D	PMW- 1D	PMW- 1S	PMW-10S	PMW-11D	PMW-11D (DUP)	RMW- 3D	RMW- 4D
beta-BHC (µg/L)	0.04	0.25 U	0.052 U	0.24 U	0.052 U	5.0 U	0.052 U	9.7 U	5.0 U	0.051 U	4.8 U	4.8 U	5.0 U	5.0 U
delta-BHC (µg/L)	0.04	5.0 U	0.052 U	4.9 U	0.052 U	5.0 U	0.052 U	9.7 U	5.0 U	0.051 U	4.8 U	4.8 U	5.0 U	5.0 U
Dieldrin (µg/L)	0.004	0.25 U	0.052 U	0.24 U	0.052 U	5.0 U	0.052 U	9.7 U	0.050 U	0.051 U	0.048 U	0.048 U	5.0 U	5.0 U
Endosulfan I (µg/L)	--	0.25 U	0.052 U	0.24 U	0.052 U	5.0 U	0.052 U	9.7 U	0.1	0.051 U	0.048 U	0.048 U	5.0 U	5.0 U
Endosulfan II (µg/L)	--	0.25 U	0.052 U	0.24 U	0.052 U	5.0 U	0.052 U	9.7 U	5.0 U	0.051 U	4.8 U	4.8 U	5.0 U	5.0 U
Endosulfan sulfate (µg/L)	--	5.0 U	0.052 U	4.9 U	0.052 U	5.0 U	0.052 U	9.7 U	5.0 U	0.051 U	4.8 U	4.8 U	5.0 U	5.0 U
Endrin (µg/L)	0	0.25 U	0.052 U	0.24 U	0.052 U	5.0 U	0.052 U	9.7 U	0.050 U	0.051 U	0.048 U	0.048 U	5.0 U	5.0 U
Endrin aldehyde (µg/L)	5	5.0 U	0.052 U	4.9 U	0.052 U	5.0 U	0.052 U	9.7 U	5.0 U	0.051 U	4.8 U	4.8 U	5.0 U	5.0 U
Endrin ketone (µg/L)	5	0.25 U	0.052 U	0.24 U	0.052 U	5.0 U	0.052 U	9.7 U	5.0 U	0.051 U	4.8 U	4.8 U	5.0 U	5.0 U
gamma-BHC (Lindane) (µg/L)	0.05	0.25 U	0.052 U	0.24 U	0.052 U	5.0 U	0.052 U	9.7 U	5.0 U	0.051 U	4.8 U	4.8 U	5.0 U	5.0 U
gamma-Chlordane (µg/L)	0.05	0.25 U	0.052 U	0.24 U	0.052 U	5.0 U	0.052 U	9.7 U	0.050 U	0.051 U	0.048 U	0.048 U	5.0 U	5.0 U
Heptachlor (µg/L)	0.04	0.25 U	0.052 U	0.24 U	0.052 U	5.0 U	0.052 U	9.7 U	0.050 U	0.051 U	0.048 U	0.048 U	5.0 U	5.0 U
Heptachlor epoxide (µg/L)	0.03	0.25 U	0.052 U	0.24 U	0.052 U	5.0 U	0.052 U	9.7 U	0.050 U	0.051 U	0.048 U	0.048 U	5.0 U	5.0 U
Methoxychlor (µg/L)	35	0.50 U	0.10 U	0.49 U	0.10 U	9.9 U	0.10 U	19 U	10 U	0.10 U	9.6 U	9.6 U	9.9 U	10 U
Toxaphene (µg/L)	0.06	9.9 U	2.1 U	9.7 U	2.1 U	200 U	2.1 U	390 U	200 U	2.0 U	190 U	190 U	200 U	200 U
Dissolved Gases														
Ethane (µg/L)	--	35	6.4	22	4.9	13	0.89 J	46	35	4.3	4.9 J	13 J	4.6	22
Ethene (µg/L)	--	1500 D	1.0 U	290	10	350	1.0 U	1500	45	0.64 J	22	35	9.9	2600
Methane (µg/L)	--	7200	690	5300	1300	8400 D	8.9	2100	16000	210	210 J	410 J	130	9500 D
Miscellaneous Parameters														
TOC (mg/L)	--	150	2.3	13	NA	6.4	1.6	230	15	3.5	7.2	12	2.3	180
Sulfate (mg/L)	250	370	1400	3300	NA	2900	740	190	41	2700	530	510	540	820
Sulfide (mg/L)	0.05	76	1.0 U	7.0	NA	7.0	1.0 U	80	2.9	1.0 U	4.1	4.1	10	210
pH (s.u.)	--	6.99	7.4	7.0	6.53	7.14	7.35	6.57	6.39	6.84	8.51	NA	7.2	7.0
CENSUS														
BVC (cells/ml)	--	NA	NA	NA	NA	NA	NA	NA	9.7E+00	0.50 U	4.95E+03	NA	NA	NA
DHBt (cells/ml)	--	NA	NA	NA	NA	NA	NA	NA	6.6 U	4.9 U	9.31E+02	NA	NA	NA
DHC (cells/ml)	--	NA	NA	NA	NA	NA	NA	NA	6.6E+02	5.4E+00	1.92E+04	NA	NA	NA
TCEr (cells/ml)	--	NA	NA	NA	NA	NA	NA	NA	5.1E+01	0.50 U	5.08E+03	NA	NA	NA
VCR (cells/ml)	--	NA	NA	NA	NA	NA	NA	NA	6.2E+02	3.4E+00	1.17E+03	NA	NA	NA

Notes:

1. NYSDEC TOGS (1,1,1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, April 2000, Glass GA.
2. Detection Limits shown are PQL

PQL - practical quantitation limit
µg/L - micrograms per liter
mg/L - milligrams per liter
cells/ml - cells per milliliter
s.u. - standard units
NA - Not Analyzed
-- no criteria

BOLD = Exceeds Criteria
R - Value is Rejected
D - Result reported from a secondary dilution analysis
J - The reported concentration is an estimated value.
U - Not detected above the method detection limit.
UJ - Not detected. The reporting limit is an estimated value.
= Ekonol-Specific Groundwater Plume Monitoring List

Table 5-4

Groundwater Analytical Result Summary - 2020 RI
Emerging Contaminant Sampling Analyses
Ekonol Polyester Resins BCP Site
Wheatfield, New York

				Location Name	INJ- 8D	MW- 3S	MW- 4S	MW-10S	MW-13S	MW-22D	PMW- 1D	PMW- 1S	PMW-10S	PMW-11D	PMW-11D	RMW- 3D	RMW- 4D	FIELDQC
				Sample Name	INJ- 8D	MW- 3S	MW- 4S	MW-10S	MW-13S	MW-22D	PMW- 1D	PMW- 1S	PMW-10S	PMW-11D	FD-GW-090920	RMW- 3D	RMW- 4D	DRILL WATER
				Sample Date	9/16/2020	9/15/2020	9/16/2020	9/14/2020	10/2/2020	10/2/2020	9/15/2020	9/9/2020	9/10/2020	9/9/2020	9/9/2020	9/15/2020	9/15/2020	9/21/2020
				Parent Sample														
Analyte	Units	CAS No.	NYSDOH MCL[1]	NYSDEC Screening Level [2]														
SW846-8270D SIM																		
1,4-Dioxane	ug/L	123-91-1	1	--	6.5	1.2	3.6	0.8	4.5	0.3 U	7.1	0.92 U	31	1.3 U	1.1 U	0.54	1.6	NA
PFAS - EPA 537 Modified																		
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	2991-50-6	--	100	30 U	30 U	2.9 U	2.7 U	2.7 U	2.6 U	30 U	30 U	2.8 U	2.7 U	2.7 U	2.9 U	30 U	3 U
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	2355-31-9	--	100	20 U	20 U	2.0 U	1.8 U	1.8 U	1.7 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.9 U	20 U	2 U
Perfluorobutanesulfonic acid (PFBS)	ng/L	375-73-5	--	100	20 U	20 U	2.0 U	1.1 J	0.53 J	0.76 J	20 U	20 U	1.9 U	0.48 J	0.58 J	0.5 J	20 U	2 U
Perfluorobutanoic acid (PFBA)	ng/L	375-22-4	--	100	49 U	50 U	4.9 UJ	6.6	11 J	4.6	25 J	22 J	3.5 J	5.5	5.6	4.4 J	49 U	2.2 J
Perfluorodecanesulfonic acid (PFDS)	ng/L	335-77-3	--	100	20 U	20 U	2.0 U	1.8 U	1.8 U	1.7 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.9 U	20 U	2 U
Perfluorodecanoic acid (PFDA)	ng/L	335-76-2	--	100	20 U	20 U	2.0 U	1.8 U	1.8 U	1.7 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.9 U	20 U	2 U
Perfluorododecanoic acid(PFDoA)	ng/L	307-55-1	--	100	20 U	20 U	2.0 U	1.8 U	1.8 U	1.7 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.9 U	20 U	2 U
Perfluoroheptanesulfonic Acid (PFHpS)	ng/L	375-92-8	--	100	20 U	20 U	2.0 U	1.8 U	1.8 U	1.7 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.9 U	20 U	2 U
Perfluorohexanoic acid (PFHxA)	ng/L	307-24-4	--	100	27	7.9 J	2.6	8.9	4.4 U	4.0 U	21	30	1.3 J	5.1	6.3	4.9	20 U	1.8 J
Perfluorooctanesulfonamide (PFOSA)	ng/L	754-91-6	--	100	20 U	20 U	2.0 U	1.8 U	1.8 U	1.7 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.9 U	20 U	2 U
Perfluoropentanoic acid (PFPeA)	ng/L	2706-90-3	--	100	40	5.3 J	1.8 J	14	19 J	8.4	62	54	2.8	9.6	10	9.0	9.5 J	1.4 J
Perfluorotetradecanoic acid (PFTeA)	ng/L	376-06-7	--	100	20 U	20 U	2.0 U	1.8 U	1.8 U	1.7 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.9 U	20 U	2 U
Perfluoroheptanoic acid (PFHpA)	ng/L	375-85-9	--	100	20 U	20 U	2.0 U	2.5	1.0 J	1.2 J	6.8 J	13 J	0.56 J	1.1 J	1.4 J	1.2 J	20 U	0.96 J
Perfluorotridecanoic acid (PFTriA)	ng/L	72629-94-8	--	100	20 U	20 U	2.0 U	1.8 U	1.8 U	1.7 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.9 U	20 U	2 U
Perfluoroundecanoic acid (PFUnA)	ng/L	2058-94-8	--	100	20 U	20 U	2.0 U	1.8 U	1.8 U	1.7 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.9 U	20 U	2 U
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ng/L	39108-34-4	--	100	30 U	30 U	2.9 U	2.7 U	2.7 U	2.6 U	30 U	30 U	2.8 U	2.7 U	2.7 U	2.9 U	30 U	3 U
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ng/L	27619-97-2	--	100	49 U	20 J	4.9 U	4.3 J	5.7	4.3 U	50 U	23 J	4.7 U	4.0 J	4.4 J	2.3 J	49 U	5 U
Perfluorohexanesulfonic acid (PFHxS)	ng/L	355-46-4	--	100	20 U	20 U	2.0 U	5.4	0.61 J	4.0	20 U	20 U	1.9 U	5.4	5.3	5.1	20 U	0.7 J
Perfluorononanoic acid (PFNA)	ng/L	375-95-1	--	100	20 U	20 U	2.0 U	1.8 U	1.8 U	1.7 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.9 U	20 U	2 U
Perfluorooctanesulfonic acid (PFOS)	ng/L	1763-23-1	--	10	20 U	20 U	2.0 U	4.1	0.9 J	1.5 J	6.9 J	6.7 J	1.9 U	1.3 J	1.5 J	1.4 J	5.1 J	2.1
Perfluorooctanoic acid (PFOA)	ng/L	335-67-1	--	10	20 U	20 U	2.0 U	4.3	1.1 J	1.7	5 J	8.5 J	1.9 U	2.2	2.1	1.6 J	20 U	1.5 J
Total NYSDEC Target PFAS List	ng/L	NA	--	500	73.5	34.4	8.0	52.0	44.3	22.2	126.7	157.2	39.2	36.0	38.3	30.9	16.2	8.9

Notes:
Detected values are shown in bold.
Detection Limits shown are PQL
bolded box = Exceedance of listed criteria.
µg/L - micrograms per liter (parts per billion)
ng/L - nanograms per liter (parts per trillion)
J - Result is less than the reporting limit (RL) but greater than or equal to the Method Detection Limit (MDL) and the concentration is an approximate value.
U - not detected above the method detection limit.
NA - Not applicable.
NS - No Sample

References:

1. NYSDOH, Center for Environmental Health, 9/2020. *Public Water Systems and NYS Drinking Water Standards for PFOA, PFOS, and 1,4-Dioxane.* Accessed at https://www.health.ny.gov/environmental/water/drinking/docs/water_supplier_fact_sheet_new_mcls.pdf
2. SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) Under NYSDEC's Part 375 Remedial Programs. NYSDEC, January, 2021.

Table 5-5

VOC Plume Status Groundwater Analytical Result Summary - 2020 RI
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Parameter	Criteria[1]	INJ- 7D	INJ- 8D	INJ-11D	INJ-13D	MW- 2S	MW- 3S	MW- 4S	MW- 7D	MW- 7D (DUP)	MW- 9S	MW-10S	MW-11D
Volatile Organic Compounds													
PCE (µg/L)	5	1000 U	100 U	200 U	1000 U	5000 U	1.0 U	25 U	200 U	200 U	1.0 U	4.0 U	1.0 U
TCE (µg/L)	5	3900	15 J	53 J	6300	5000 U	0.13 J	28	45 J	48 J	1.0 U	1.2 J	1.4
Cis-1,2-DCE (µg/L)	5	190000 D	2000	5000	93000	160000	1.0 U	930	5700	5200	0.17 J	97	12
Trans-1,2-DCE (µg/L)	5	200 J	28 J	200 U	1000 U	1200 J	1.0 U	13 J	46 J	49 J	0.17 J	4.0 U	0.74 J
1,1-DCE (µg/L)	5	420 J	67 J	200 U	1000 U	5000 U	1.0 U	25 U	200 U	200 U	1.0 U	4.0 U	0.71 J
Vinyl Chloride (µg/L)	2	21000	2400	1800	16000	14000	1.0 U	1200	2500	3100	1.0 U	32	34
1,1,1-Trichloroethane (µg/L)	5	1000 U	1000	200 U	1000 U	5000 U	1.0 U	25 U	110 J	100 J	1.0 U	4.0 U	57
1,1-Dichloroethane (µg/L)	5	1000 U	600	200 U	1000 U	5000 U	1.0 U	25 U	320	280	1.0 U	4.0 U	29
Chloroethane (µg/L)	5	1000 U	100 U	200 U	1000 U	5000 U	1.0 U	25 U	200 U	200 U	1.0 U	4.0 U	1.4
Benzene (µg/L)	1	1000 U	100 U	200 U	1000 U	5000 U	0.21 J	25 U	200 U	200 U	1.0 U	4.0 U	1.0 U
Ethylbenzene (µg/L)	5	1000 U	100 U	200 U	1000 U	5000 U	1.0 U	25 U	200 U	200 U	1.0 U	4.0 U	1.0 U
Naphthalene (µg/L)	10	1000 U	0.77 U	200 U	1000 U	5000 U	0.21 U	0.24 U	200 U	200 U	1.0 U	0.21 U	1.0 U
Toluene (µg/L)	5	1000 U	100 U	200 U	1000 U	5000 U	1.0 U	25 U	200 U	200 U	1.0 U	4.0 U	1.0 U
Xylenes, Total (µg/L)	5	2000 U	200 U	400 U	2000 U	10000 U	2.0 U	50 U	400 U	400 U	2.0 U	8.0 U	2.0 U
Dissolved Metals													
Iron, Dissolved (mg/L)	--	4.3	0.11	0.43	0.84	3.6	1.5	0.086 J	0.057 J	0.056 J	0.39	1.9	NA
Potassium, Dissolved (mg/L)	--	6.8	4.9	12	9.1	3.2 J	13	6.5	9.8	9.5	5	2.3	NA
Dissolved Gases													
Ethane (µg/L)	--	48	35	170	230	62	6.4	22	27 J	36 J	1.0 U	4.9	3.2
Ethene (µg/L)	--	5000	1500	1100	7100	230	1.0 U	290	1800 J	1900 J	1.0 U	10	30
Methane (µg/L)	--	3300	7200 D	15000	17000	960	690	5300	18000 DJ	6200 DJ	23	1300	410
Miscellaneous Parameters													
TOC (mg/L)	--	100	150	12	160	3.9	2.3	13	210	210	4.9	NA	NA
Sulfate (mg/L)	250	63	370	260	160	1300	1400	3300	580	570	2600	NA	NA
Sulfide (mg/L)	0.05	2.2	76	21	26	1.0 U	1.0 U	7.0	340	330	1.0 U	NA	NA
pH (s.u.)	--	6.93	6.99	7.07	6.8	6.8	7.4	7.0	7.1 J	NA	6.56	6.53	7.94
CENSUS													
BVC (cells/ml)	--	7.48E+04	NA	NA	NA	4.18E+03	NA	NA	NA	NA	NA	NA	NA
DHBt (cells/ml)	--	1.17E+04	NA	NA	NA	3.48E+01	NA	NA	NA	NA	NA	NA	NA
DHC (cells/ml)	--	4.94E+05	NA	NA	NA	5.94E+03	NA	NA	NA	NA	NA	NA	NA
TCEr (cells/ml)	--	1.03E+04	NA	NA	NA	2.70E+00	NA	NA	NA	NA	NA	NA	NA
VCR (cells/ml)	--	7.60E+04	NA	NA	NA	2.37E+01	NA	NA	NA	NA	NA	NA	NA

See Page 4 of 4 for notes.

Table 5-5

VOC Plume Status Groundwater Analytical Result Summary - 2020 RI
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Parameter	Criteria[1]	MW-11S	MW-12S	MW-12S (DUP)	MW-13D	MW-13S	MW-15D	MW-17D	MW-19D	MW-20D	MW-21D	MW-22D	OR- 4SM
Volatile Organic Compounds													
PCE (µg/L)	5	4.0 U	50 U	50 U	5.0 U	100 U	4.0 U	1.0 U	1.0 U	5.0 U	20 U	0.65 J	1.0 U
TCE (µg/L)	5	21	1100	950	19	100 U	1.2 J	0.39 J	1.0 U	2.9 J	20 U	0.68 J	1.0 U
Cis-1,2-DCE (µg/L)	5	110	1200	1100	130	3200	150	7.1	5.6	48	410	2.0	0.46 J
Trans-1,2-DCE (µg/L)	5	3.4 J	48 J	50	1.0 J	22 J	2.5 J	0.35 J	0.30 J	2.4 J	20 U	1.0 U	2.1
1,1-DCE (µg/L)	5	4.0 U	50 U	50 U	5.0 U	100 U	1.1 J	0.24 J	1.0 U	1.8 J	20 U	1.0 U	1.0 U
Vinyl Chloride (µg/L)	2	79	580	590	260	820	400	29	0.66 J	330	390	0.20 J	0.55 J
1,1,1-Trichloroethane (µg/L)	5	4.0 U	50 U	50 U	5.0 U	100 U	29	22	1.0 U	150	15 J	4.8	1.0 U
1,1-Dichloroethane (µg/L)	5	1.9 J	15 J	15 J	7.1	100 U	21	14	1.0 U	45	19 J	1.4	0.61 J
Chloroethane (µg/L)	5	4.0 U	50 U	50 U	5.0 U	100 U	4.0 U	1.0 U	1.0 U	5.0 U	20 U	1.0 U	1.0 U
Benzene (µg/L)	1	4.0 U	50 U	50 U	5.0 U	100 U	4.0 U	1.0 U	1.0 U	5.0 U	20 U	1.0 U	2.7
Ethylbenzene (µg/L)	5	4.0 U	50 U	50 U	5.0 U	100 U	4.0 U	1.0 U	1.0 U	5.0 U	20 U	1.0 U	2.1
Naphthalene (µg/L)	10	4.0 U	50 U	50 U	5.0 U	0.21 U	4.0 U	1.0 U	1.0 U	5.0 U	20 U	0.20 U	0.41 J
Toluene (µg/L)	5	4.0 U	50 U	50 U	5.0 U	100 U	4.0 U	1.0 U	1.0 U	5.0 U	20 U	1.0 U	2.2
Xylenes, Total (µg/L)	5	8.0 U	100 U	100 U	10 U	200 U	8.0 U	2.0 U	2.0 U	10 U	40 U	2.0 U	9.6
Dissolved Metals													
Dissolved Iron (mg/L)	--	NA	NA	NA	0.3	1.3	0.37	NA	2.0	NA	NA	0.56	1.5
Dissolved Potassium (mg/L)	--	NA	NA	NA	4.6 J	6.5	4.7 J	NA	5.4	NA	NA	3.1	15
Dissolved Gases													
Ethane (µg/L)	--	14	28 J	29 J	7.0	13	1.5	3.6	0.57 J	6.0	2.7	0.89 J	3.3 J
Ethene (µg/L)	--	21	710	730	110	350	29	21	1.0 U	130	39	1.0 U	0.93 J
Methane (µg/L)	--	590	4600 D	4900 D	1600	8400 D	260	510	25	1000	380	8.9	10000 J
Miscellaneous Parameters													
TOC (mg/L)	--	NA	NA	NA	2.8	6.4	2.9	NA	6.1	NA	NA	1.6	32
Sulfate (mg/L)	250	NA	NA	NA	1200	2900	840	NA	2800 J	NA	NA	740	33
Sulfide (mg/L)	0.05	NA	NA	NA	2.0	7.0	0.93 J	NA	1.0 U	NA	NA	1.0 U	4.1
pH (s.u.)	--	7.06	7.15	NA	6.80	7.14	6.93	7.89	7.68	10.48 R	7.07	7.35	7.97
CENSUS													
BVC (cells/ml)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DHBt (cells/ml)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DHC (cells/ml)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TCEr (cells/ml)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VCR (cells/ml)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Page 4 of 4 for notes.

Table 5-5

VOC Plume Status Groundwater Analytical Result Summary - 2020 RI
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Parameter	Criteria[1]	OR- 6SM	OR-10SM	OR-14SM	OR-18SM	PMW- 1D	PMW- 1S	PMW- 2D	PMW- 3S	PMW- 4S	PMW- 6D	PMW- 6S
Volatile Organic Compounds												
PCE (µg/L)	5	2.0 U	2.0 U	1.0 U	1.0 U	5000 U	13 U	1000 U	200 U	250 U	500 U	100 U
TCE (µg/L)	5	2.0 U	2.0 U	0.50 J	1.0 U	7300	1.7 J	410 J	73 J	250 U	120 J	100 U
Cis-1,2-DCE (µg/L)	5	17	1.1 J	40	11	180000	330	36000	4500	9000	26000	3800
Trans-1,2-DCE (µg/L)	5	3.2	1.5 J	0.86 J	2.6	5000 U	8.7 J	1000 U	72 J	200 J	140 J	97 J
1,1-DCE (µg/L)	5	2.0 U	2.0 U	1.0 U	1.0 U	5000 U	13 U	1000 U	200 U	250 U	500 U	100 U
Vinyl Chloride (µg/L)	2	4.9	1.7 J	15	20	12000	160	6900	1100	2100	4500	2400
1,1,1-Trichloroethane (µg/L)	5	2.0 U	2.0 U	1.0 U	1.0 U	5000 U	13 U	1000 U	200 U	250 U	500 U	100 U
1,1-Dichloroethane (µg/L)	5	1.9 J	0.82 J	0.83 J	0.30 J	5000 U	13 U	1000 U	200 U	250 U	500 U	100 U
Chloroethane (µg/L)	5	2.0 U	2.0 U	1.0 U	1.0 U	5000 U	13 U	1000 U	200 U	250 U	500 U	100 U
Benzene (µg/L)	1	2.5	1.3 J	1.1	1.0 U	5000 U	13 U	1000 U	200 U	250 U	500 U	100 U
Ethylbenzene (µg/L)	5	1.6 J	2.0 U	0.56 J	0.13 J	5000 U	13 U	1000 U	200 U	250 U	500 U	100 U
Naphthalene (µg/L)	10	2.0 U	2.0 U	1.0 U	1.0 U	3.8 U	0.21 U	1000 U	200 U	250 U	500 U	100 U
Toluene (µg/L)	5	4.4	0.85 J	1.6	1.0 U	5000 U	13 U	1000 U	200 U	250 U	500 U	100 U
Xylenes, Total (µg/L)	5	12	0.62 J	2.5	0.20 J	10000 U	1.9 J	2000 U	400 U	500 U	1000 U	200 U
Dissolved Metals												
Dissolved Iron (mg/L)	--	0.11 J	13	0.57	0.2 U	0.058 J	3.7	0.52	0.41	4.3	0.2 U	1.7
Dissolved Potassium (mg/L)	--	17	5.7	11	4 J	8.1	10	10	7.6	4.6 J	10	7.7
Dissolved Gases												
Ethane (µg/L)	--	88 J	8.0	14	12	46	35	150	54 J	100	38 J	16
Ethene (µg/L)	--	58 J	25	79	260	1500	45	4300	240 J	230	2400 J	260
Methane (µg/L)	--	7700 J	8100	11000	5000	2100	16000	12000 D	10000 DJ	7200 D	15000 J	7700
Miscellaneous Parameters												
TOC (mg/L)	--	24	120	13	3.2	230	15	180	9.3	2.3	220	18
Sulfate (mg/L)	250	67	28	480	460	190	41	98	570	980	800	460
Sulfide (mg/L)	0.05	26	4.9	85	21	80	2.9	130	2.0	1.0 U	190	1.0 U
pH (s.u.)	--	8.07	6.8	8.58	6.79	6.57	6.39	7.0	6.6	6.7 J	6.63	8.29
CENSUS												
BVC (cells/ml)	--	3.05E+03	NA	6.60E+00	NA	NA	9.70E+00	4.91E+03	2.44E+03	NA	6.89E+03	NA
DHBt (cells/ml)	--	11.1 U	NA	5.4 U	NA	NA	6.6 U	6.71E+02	4.7 U	NA	3.16E+03	NA
DHC (cells/ml)	--	4.73E+04	NA	4.47E+02	NA	NA	6.58E+02	6.18E+05	1.08E+04	NA	2.13E+05	NA
TCEr (cells/ml)	--	1.76E+03	NA	2.94E+01	NA	NA	5.12E+01	8.89E+04	6.70E+01	NA	1.83E+04	NA
VCR (cells/ml)	--	1.84E+04	NA	2.05E+02	NA	NA	6.16E+02	5.02E+04	3.17E+03	NA	4.11E+04	NA

See Page 4 of 4 for notes.

Table 5-5

VOC Plume Status Groundwater Analytical Result Summary - 2020 RI
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Parameter	Criteria[1]	PMW- 8D	PMW- 9D	PMW-10D	PMW-10S	PMW-11D	PMW-11D (DUP)	PMW-16D	PMW-17D	RMW- 2D	RMW- 3D	RMW- 4D
Volatile Organic Compounds												
PCE (µg/L)	5	500 U	1000 U	200 U	1.0 U	200 U	200 U	500 U	20 U	2000 U	100 U	500 U
TCE (µg/L)	5	6900	460 J	97 J	0.13 J	48 J	49 J	3900	3.2 J	21000	100 U	500 U
Cis-1,2-DCE (µg/L)	5	38000	46000	11000	1.0 U	870	860	32000	350	350000 D	440	10000
Trans-1,2-DCE (µg/L)	5	170 J	1000 U	72 J	1.0 U	200 U	200 U	200 J	5.4 J	820 J	100 U	500 U
1,1-DCE (µg/L)	5	500 U	1000 U	200 U	1.0 U	66 J	71 J	500 U	3.8 J	2000 U	72 J	500 U
Vinyl Chloride (µg/L)	2	6300	21000	5200	26	120 J	140 J	32000	1600	4300	130	3200
1,1,1-Trichloroethane (µg/L)	5	500 U	1000 U	200 U	1.0 U	3700	3800	1900	380	2000 U	2200	500 U
1,1-Dichloroethane (µg/L)	5	500 U	1000 U	100 J	1.0 U	160 J	170 J	440 J	150	2000 U	120	500 U
Chloroethane (µg/L)	5	500 U	1000 U	200 U	1.0 U	200 U	200 U	500 U	20 U	2000 U	100 U	500 U
Benzene (µg/L)	1	500 U	1000 U	200 U	1.0 U	200 U	200 U	500 U	20 U	2000 U	100 U	500 U
Ethylbenzene (µg/L)	5	500 U	1000 U	200 U	1.0 U	200 U	200 U	500 U	20 U	2000 U	100 U	500 U
Naphthalene (µg/L)	10	500 U	1000 U	200 U	0.21 U	0.19 U	0.19 U	500 U	20 U	2000 U	0.21 U	2.0 U
Toluene (µg/L)	5	500 U	1000 U	200 U	1.0 U	200 U	200 U	500 U	20 U	2000 U	100 U	500 U
Xylenes, Total (µg/L)	5	1000 U	2000 U	400 U	2.0 U	400 U	400 U	1000 U	40 U	4000 U	200 U	1000 U
Dissolved Metals												
Iron, Dissolved (mg/L)	--	0.2 U	42	28	0.1 U	1.8	1.7	0.031 J	0.074 J	0.043 J	0.11	0.1 U
Potassium, Dissolved (mg/L)	--	8.5	21	4.7 J	4.7	2.8	2.8	4.9 J	2.9 J	5.4	2.8	0.1 U
Dissolved Gases												
Ethane (µg/L)	--	61	470	500	4.3	4.9 J	13 J	95	14	110	4.6	22
Ethene (µg/L)	--	2000	6500	5200	0.64 J	22	35	3800	760	980	9.9	2600
Methane (µg/L)	--	14000	19000	17000 D	210	210 J	410 J	12000	4700 D	2500	130	9500 D
Miscellaneous Parameters												
TOC (mg/L)	--	150	200	210	3.5	7.2	12	100	34	270	2.3	180
Sulfate (mg/L)	250	1700	40	25 U	2700	530	510	48	18	270	540	820
Sulfide (mg/L)	0.05	240	1.0	6.2	1.0 U	4.1	4.1	100	7.0	160	10	210
pH (s.u.)	--	6.84	7.08	6.4 J	6.84	8.51	NA	7.3	7.9	6.62	7.2	7.0
CENSUS												
BVC (cells/ml)	--	NA	NA	NA	0.50 U	4.95E+03	NA	NA	1.19E+02	5.87E+03	NA	NA
DHBt (cells/ml)	--	NA	NA	NA	4.9 U	9.31E+02	NA	NA	5.0 U	3.22E+04	NA	NA
DHC (cells/ml)	--	NA	NA	NA	5.40E+00	1.92E+04	NA	NA	1.36E+03	8.56E+04	NA	NA
TCEr (cells/ml)	--	NA	NA	NA	0.50 U	5.08E+03	NA	NA	8.50E+02	6.87E+03	NA	NA
VCR (cells/ml)	--	NA	NA	NA	3.40E+00	1.17E+03	NA	NA	2.02E+03	1.26E+04	NA	NA

Notes:
1. NYSDEC TOGS (1,1,1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, April 2000, Glass GA.

2. Detection Limits shown are PQL
PQL - practical quantitation limit
µg/L - micrograms per liter
mg/L - milligrams per liter
cells/ml - cells per milliliter
s.u. - standard units
NA - Not Analyzed
-- no criteria

BOLD = Exceeds Criteria
R - Value is Rejected
D - Result reported from a secondary dilution analysis
J - The reported concentration is an estimated value.
U - Not detected above the method detection limit.
UJ - Not detected. The reporting limit is an estimated value.
= 2020 RI BCP Site Monitoring Location - Cross-referenced on Table 5-3

Table 5-6

Groundwater Sampling Field Parameter Results
Groundwater Sampling Event - 2020 RI
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Monitoring Well ID	Sample Date	Temperature (deg C)	Specific Conductivity (mS/cm)	Dissolved Oxygen (1) (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)	Alkalinity (mg/L) (3)	Carbon Dioxide (mg/L) (4)	Ferrous Iron (mg/L) (5)	Hydrogen Sulfide (mg/L) (6)
Overburden Bioreactor Monitoring Wells											
OR-4SM	9/10/2020	16.56	5.230	0.49	7.97	-268.7	8.84	1925	-	0.54	>5.0
OR-6SM	9/10/2020	17.06	8.677	0.68	8.07	-316.9	7.03	1540	-	0.18	>5.0
OR-10SM	9/11/2020	16.26	7.689	1.00	6.8(2)	-240.4	>1000	1925	-	1.46	3.0
OR-14SM	9/10/2020	15.99	4.811	0.78	8.58	-358.7	16.6	1540	430 J	0.11	>5.0
OR-18SM	9/11/2020	16.55	1.455	0.93	6.79	-278.7	5.89	770	-	0.02	0.15
PMW-1S	9/9/2020	19.30	6.246	0.64	6.39	-205.8	3.16	770	-	1.44	0.5
PMW-3S	9/17/2020	16.45	5.120	0.53	6.6(2)	-115.5	19.2	770	80	0.50	>5.0
PMW-4S	9/17/2020	16.63	6.524	1.15	6.7(2)	-39.2	2.94	770	155	1.49	0.0
PMW-6S	9/11/2020	16.31	3.469	0.49	8.29	-83.4	26.3	1155	-	2.33	5.0
PMW-10S	9/11/2020	16.47	4.510	3.36	6.84	97.1	4.27	770	-	0.64	0.1
Bedrock Injection/Withdrawal Wells											
INJ-7D	9/17/2020	16.22	1.609	2.11	6.93	-241.9	13.2	770	125	0.67	>5.0
INJ-8D	9/16/2020	16.05	3.597	0.53	6.99	-331.0	8.93	770	150	0.18	>5.0
INJ-11D	9/18/2020	15.46	4.551	2.11	7.07	-316.6	8.21	385	75	0.12	>5.0
INJ-13D	9/18/2020	13.10	4.889	1.14	6.8(2)	-351.7	7.22	770	175	0.46	>5.0
Bedrock Monitoring Wells											
PMW-9D	9/18/2020	16.04	4.423	5.80	7.08	-106.9	31.8	770	180	0.98	0.1
PMW-10D	9/17/2020	15.21	2.189	0.18	6.4(2)	-285.1	700	770	170	1.83	>5.0
PMW-11D	9/9/2020	13.74	1.668	0.28	8.51	-292.0	3.81	385	90 J	1.50	1.5
PMW-16D	9/18/2020	14.18	3.721	1.35	7.3 (2)	-340.9	7.09	770	130	0.02	>5.0
PMW-17D	9/16/2020	16.49	1.060	0.90	7.9 (2)	-220.2	10.0	385	20	0.01	2.0
Pilot Test Wells											
PMW-1D	9/15/2020	16.15	4.773	0.71	6.57	-318.3	9.27	770	195	0.00	>5.0
PMW-2D	9/16/2020	14.14	5.808	0.79	7.0 (2)	-326.0	5.72	1155	90	0.50	>5.0
PMW-6D	9/9/2020	16.34	8.081	2.57	6.63	-369.3	8.43	1540	270 J	0.09	>5.0
RMW-4D	9/15/2020	13.92	6.063	0.92	7.0 (2)	-349.9	5.51	1155	290	0.01	>5.0
PMW-8D	9/18/2020	16.26	5.762	1.81	6.84	-339.8	4.39	1155	210	0.00	>5.0
MW-7D	9/17/2020	14.04	8.144	0.90	7.1 J (2)	-364.8	6.43	1155	215	0.03	>5.0

Table 5-6

Groundwater Sampling Field Parameter Results
Groundwater Sampling Event - 2020 RI
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Monitoring Well ID	Sample Date	Temperature (deg C)	Specific Conductivity (mS/cm)	Dissolved Oxygen (1) (mg/L)	pH (standard units)	ORP (mV)	Turbidity (NTU)	Alkalinity (mg/L) (3)	Carbon Dioxide (mg/L) (4)	Ferrous Iron (mg/L) (5)	Hydrogen Sulfide (mg/L) (6)
Site Investigation Wells											
MW-2S	9/16/2020	21.80	4.611	1.14	6.80	-160.4	2.04	770	150	2.02	0.0
MW-3S	9/15/2020	15.24	11.351	6.08	7.4 (2)	107.4	3.87	<385	30	0.46	0.0
MW-4S	9/17/2020	16.40	5.944	0.48	7.0 (2)	-244.9	26.8	770	65	0.13	>5.0
MW-10S	9/14/2020	16.42	2.319	0.78	6.53	-121.8	2.73	<385	80	1.37	0.0
MW-11S	9/10/2020	13.96	5.083	1.57	7.94	-39.7	7.14	<385	-	0.45	0.2
MW-12S	9/14/2020	16.18	6.538	0.85	7.15 (2)	-282.3	5.02	770	130	0.07	5.0
MW-13S	10/2/2020	15.39	1.732	0.25	7.14	-109.1	2.43	770	250	0.49	5.0
RMW-2D	9/17/2020	17.20	2.962	1.73	6.62	-315.6	39.5	770	190	0.08	>5.0
RMW-3D	9/15/2020	13.85	1.550	0.75	7.2 (2)	-289.9	5.85	<385	70	0.06	5.0
MW-11D	9/10/2020	13.41	2.492	0.66	7.06	-197.6	0.34	<385	-	0.09	0.5
MW-17D	9/10/2020	13.91	2.342	0.77	7.89	-277.0	0.51	<385	-	0.04	5.0
MW-20D	9/14/2020	14.67	3.035	1.53	R	-192.2	1.21	<385	80	0.06	5.0
MW-21D	9/14/2020	14.47	2.153	0.80	7.07	-128.7	5.88	<385	60	0.75	0.2
MW-22D	10/2/2020	13.64	1.312	0.30	7.35	-32.2	4.40	385	50	0.37	0.0
Investigative Monitoring Wells											
MW-15D	9/11/2020	16.05	2.171	0.65	6.93	-237.0	3.31	770	-	0.31	4.0
MW-19D	9/11/2020	14.00	5.019	0.56	7.68	17.3	7.44	770	-	1.93	0.0
MW-13D	9/14/2020	12.86	3.372	1.04	6.80	-244.9	0.88	<385	70	0.28	0.3
MW-9S	9/11/2020	16.82	5.104	0.79	6.56	42.6	1.85	770	-	0.25	0.0

Notes:
(1) Elevated dissolved oxygen readings in some cases conflict with negative oxidation/reduction potential readings.
(2) A review of the field sheets and daily calibration sheets concluded 15 locations, all sampled using the same water quality meter, were anomalous and/or had a pH > 9. At 13 of these locations there was sample volume at the laboratory to run pH as a laboratory analysis. MW-12S pH was re-collected in the field using an in-situ water quality meter on 9/28/2020. MW-20D did not have enough sample to run a laboratory pH and was rejected. The listed pHs are the laboratory verified result and are in-line with historical norms for pH at these locations. Original field pHs for the following locations have been rejected (INJ-13D, OR-10SM, MW-3S, MW-4S, MW-12S, MW-7D, PMW-2D, PMW-3S, PMW-4S, PMW-10D, PMW-16D, PMW-17D, and RMW-4D. The results were rejected due to possible water quality pH meter malfunction, incorrect field calibration, or calibration solution failure. Please refer to the field sampling logs for the rejected pH values.
(3) HACH Alkalinity Test Kit, Model AL-TA used for field testing.
(4) HACH Carbon Dioxide Test Kit, Model CA-23 used for field testing. Field crew reported problems getting readable results with the titration solution. New solution was obtained and used from September 14, 2020 through October 2, 2020. Locations with results obtained prior to September 14, 2020 may be biased and were assigned a J value.
(5) HACH DR-890 Colorimeter used for field testing.

mS/cm - milliSiemen per centimeter
mg/L - milligram per liter
mV - millivolt
J - The reported concentration is an estimated value.
R - Value is Rejected

NTU - nephelometric turbidity unit
ORP - oxidation-reduction potential
- Not Measured

Table 5-7

Indoor/Outdoor Air Sample Results (April 22, 2021)
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Parameter	Units	Criteria[1]	ID-1 IA	ID-1 IA (DUP)	OUTDOOR-1
Volatile Organic Compounds					
1,1,1-Trichloroethane	µg/m3	--	1.1 U	1.1 U	1.1 U
1,1,2,2-Tetrachloroethane	µg/m3	--	1.4 U	1.4 U	1.4 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m3	--	0.50 J	0.57 J	0.51 J
1,1,2-Trichloroethane	µg/m3	--	1.1 U	1.1 U	1.1 U
1,1-Dichloroethane	µg/m3	--	0.81 U	0.81 U	0.81 U
1,1-Dichloroethene	µg/m3	--	0.20 U	0.20 U	0.20 U
1,2,4-Trichlorobenzene	µg/m3	--	3.7 U	3.7 U	3.7 U
1,2,4-Trimethylbenzene	µg/m3	--	0.98 U	0.24 J	0.98 U
1,2-Dibromoethane (Ethylene dibromide)	µg/m3	--	1.5 U	1.5 U	1.5 U
1,2-Dichlorobenzene	µg/m3	--	1.2 U	1.2 U	1.2 U
1,2-Dichloroethane	µg/m3	--	0.81 U	0.81 U	0.81 U
1,2-Dichloroethene (cis)	µg/m3	--	0.20 U	0.20 U	0.20 U
1,2-Dichloroethene (total)	µg/m3	--	1.6 U	1.6 U	1.6 U
1,2-Dichloroethene (trans)	µg/m3	--	0.79 U	0.79 U	0.79 U
1,2-Dichloropropane	µg/m3	--	0.92 U	0.92 U	0.92 U
1,2-Dichlorotetrafluoroethane	µg/m3	--	1.4 U	1.4 U	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	µg/m3	--	0.98 U	0.98 U	0.98 U
1,3-Butadiene	µg/m3	--	0.44 U	0.44 U	0.44 U
1,3-Dichlorobenzene	µg/m3	--	1.2 U	1.2 U	1.2 U
1,3-Dichloropropene (cis)	µg/m3	--	0.91 U	0.91 U	0.91 U
1,3-Dichloropropene (trans)	µg/m3	--	0.91 U	0.91 U	0.91 U
1,4-Dichlorobenzene	µg/m3	--	1.2 U	1.2 U	1.2 U
1,4-Dioxane	µg/m3	--	18 U	18 U	18 U
2,2,4-Trimethylpentane	µg/m3	--	0.93 U	0.93 U	0.93 U
2-Chlorotoluene	µg/m3	--	1.0 U	1.0 U	1.0 U
2-Hexanone	µg/m3	--	2.0 U	2.0 U	2.0 U
3-Chloropropene	µg/m3	--	1.6 U	1.6 U	1.6 U
4-Ethyltoluene	µg/m3	--	0.98 U	0.98 U	0.98 U
4-Isopropyltoluene (p-Cymene)	µg/m3	--	1.1 U	1.1 U	1.1 U
4-Methyl-2-pentanone	µg/m3	--	2.0 U	2.0 U	2.0 U
Acetone	µg/m3	--	62	64	7.0 J
Benzene	µg/m3	--	0.33 J	0.32 J	0.28 J
Benzyl chloride	µg/m3	--	1.0 U	1.0 U	1.0 U
Bromodichloromethane	µg/m3	--	1.3 U	1.3 U	1.3 U
Bromoform	µg/m3	--	2.1 U	2.1 U	2.1 U
Bromomethane	µg/m3	--	0.78 U	0.78 U	0.78 U
Carbon disulfide	µg/m3	--	1.6 U	1.6 U	1.6 U
Carbon tetrachloride	µg/m3	--	0.51	0.48	0.49

See Page 2 of 2 for notes.

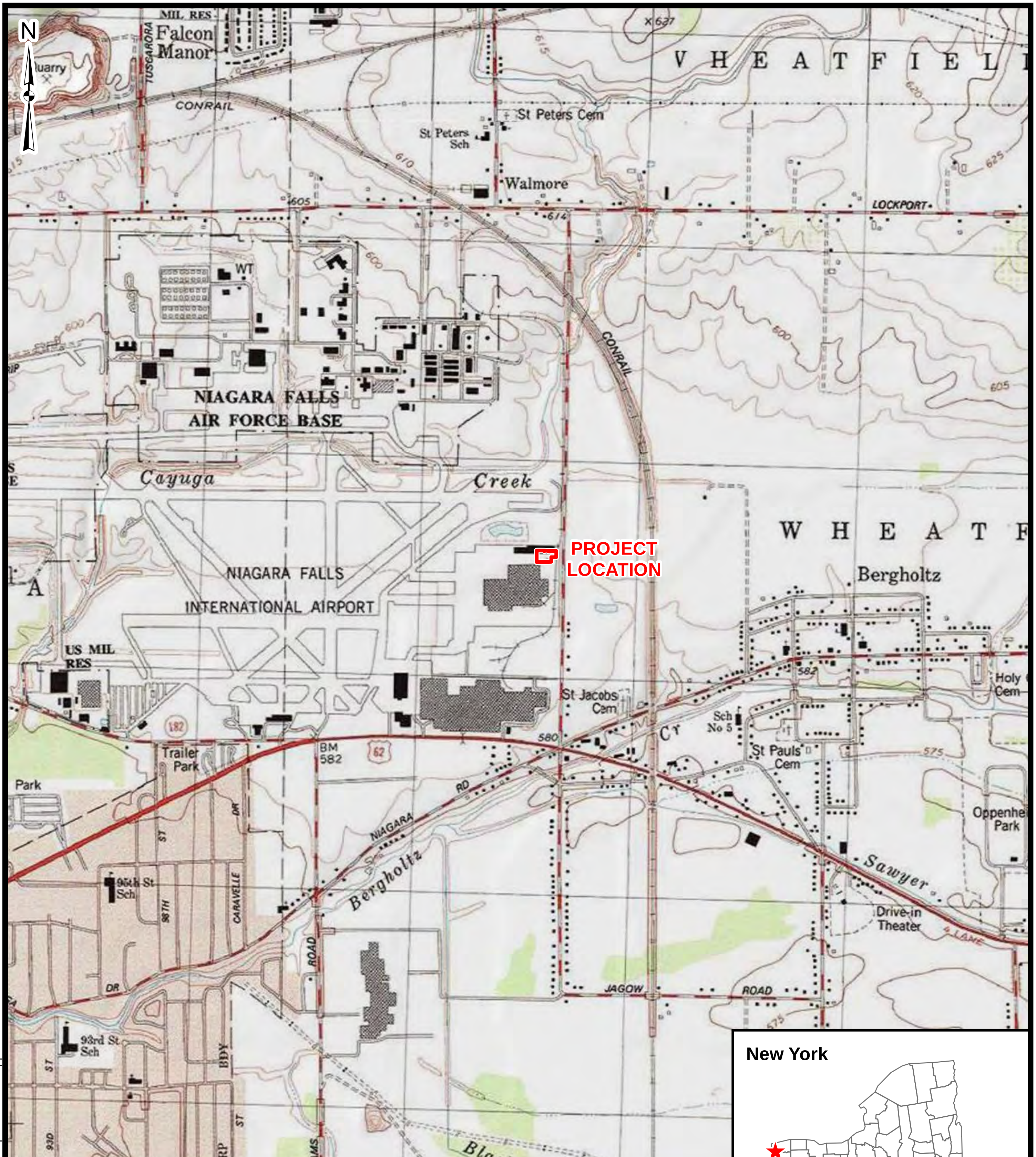
Table 5-7

Indoor/Outdoor Air Sample Results (April 22, 2021)
Ekonol Polyester Resins BCP Site
Wheatfield, New York

Parameter	Units	Criteria[1]	ID-1 IA	ID-1 IA (DUP)	OUTDOOR-1
Volatile Organic Compounds					
Chlorobenzene	µg/m^3	--	0.92 U	0.92 U	0.92 U
Chlorodifluoromethane	µg/m^3	--	1.1 J	1.2 J	1.1 J
Chloroethane	µg/m^3	--	1.3 U	1.3 U	1.3 U
Chloroform	µg/m^3	--	0.98 U	0.98 U	0.98 U
Chloromethane	µg/m^3	--	1.6	1.5	1.4
Cyclohexane	µg/m^3	--	0.69 U	0.69 U	0.69 U
Dibromochloromethane	µg/m^3	--	1.7 U	1.7 U	1.7 U
Dichlorodifluoromethane	µg/m^3	--	2.4 J	2.4 J	2.5
Ethylbenzene	µg/m^3	--	0.87 U	0.87 U	0.87 U
Heptane	µg/m^3	--	0.55 J	0.27 J	0.82 U
Hexachlorobutadiene	µg/m^3	--	2.1 U	2.1 U	2.1 U
Hexane	µg/m^3	--	0.70 U	0.70 U	0.70 U
Isopropanol	µg/m^3	--	44	45	12 U
Isopropylbenzene (Cumene)	µg/m^3	--	0.98 U	0.98 U	0.98 U
m&p-Xylene	µg/m^3	--	0.46 J	2.2 U	2.2 U
Methyl ethyl ketone (2-Butanone)	µg/m^3	--	0.85 J	0.97 J	0.92 J
Methyl tert-butyl ether	µg/m^3	--	0.72 U	0.72 U	0.72 U
Methylene chloride	µg/m^3	60	1.7 U	1.7 U	1.7 U
Methylmethacrylate	µg/m^3	--	2.0 U	2.0 U	2.0 U
Naphthalene	µg/m^3	--	1.9 J	2.0 J	2.6 U
n-Butane	µg/m^3	--	110 D	120 D	1.1 J
o-Xylene	µg/m^3	--	0.87 U	0.87 U	0.87 U
Styrene	µg/m^3	--	0.85 U	0.85 U	0.85 U
t-Butyl alcohol	µg/m^3	--	3.3 J	3.5 J	15 U
Tetrachloroethene	µg/m^3	30	1.4 U	1.4 U	1.4 U
Tetrahydrofuran	µg/m^3	--	15 U	15 U	15 U
Toluene	µg/m^3	--	0.52 J	0.54 J	0.75 U
Trichloroethene	µg/m^3	2	0.21	0.20 U	0.20 U
Trichlorofluoromethane	µg/m^3	--	1.5	1.5	1.5
Vinyl bromide	µg/m^3	--	0.87 U	0.87 U	0.87 U
Vinyl chloride	µg/m^3	--	0.20 U	0.20 U	0.20 U

Notes:
1. Table 3.1 Air Guideline Values Derived by NYSDOH in *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* . Issued October 2006 Updated September 2013, and August 2015.
2. Detection Limits shown are PQL.
PQL - practical quantitation limit
µg/m^3 - micrograms per cubic meter
D - Result reported from a secondary dilution analysis.
J - The reported concentration is an estimated value.
U - Not detected above the method detection limit.
BOLD = Exceeds Criteria
-- no criteria

FIGURES



Source: USA Topo Maps, ESRI Map Service; 1:24,000-scale USGS Topographic Map, Ransomville, 1996 Tonawanda West, 1996

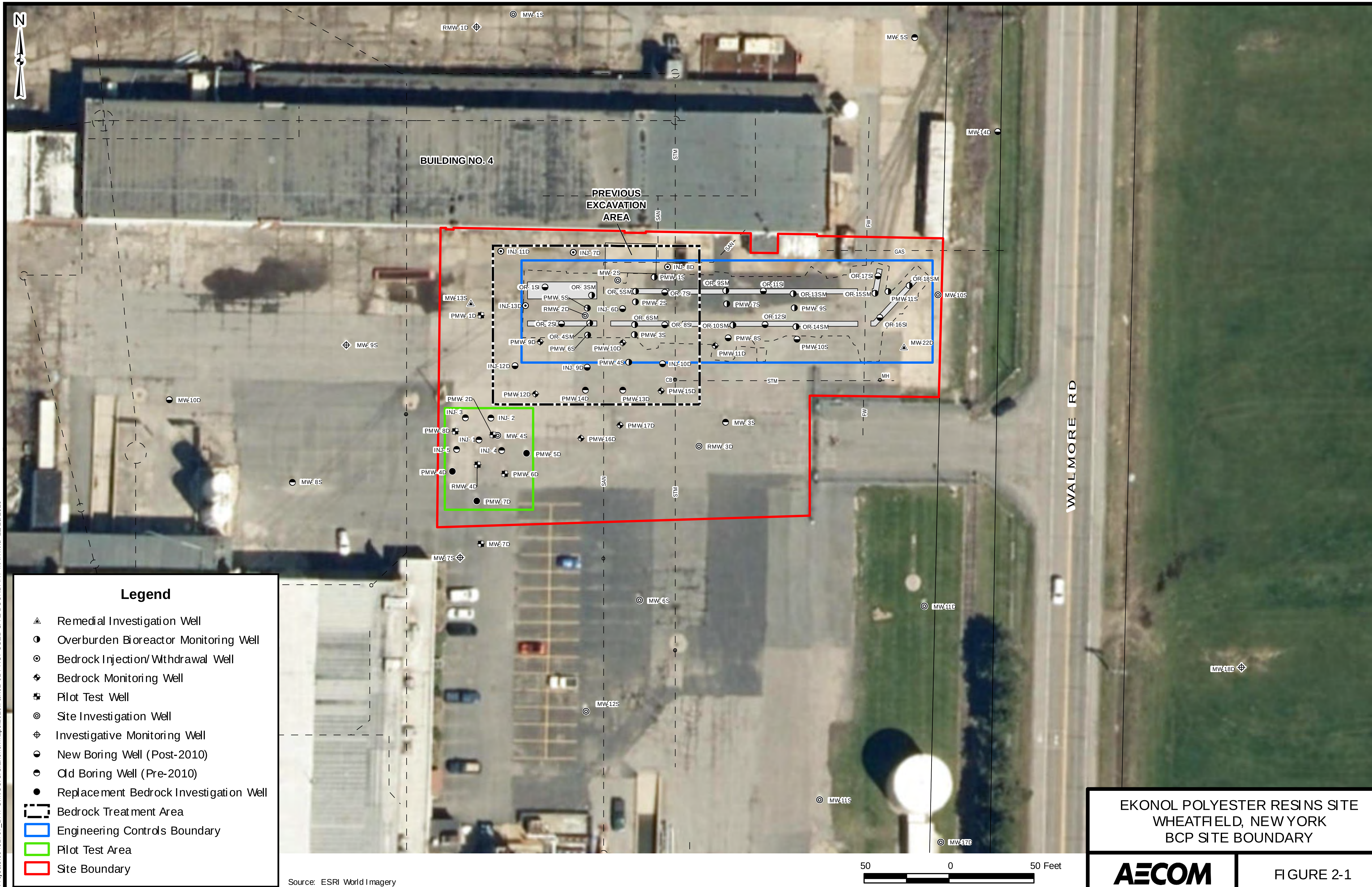
2,000 0 2,000 Feet

AECOM

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
SITE LOCATION MAP

FIGURE 1-1

J:\Projects\60481767_BPIPO\MISC\GIS\Ekonol\Maps\Brownfield App\01 SITE LOCATION MAP.mxd 9/20/2018

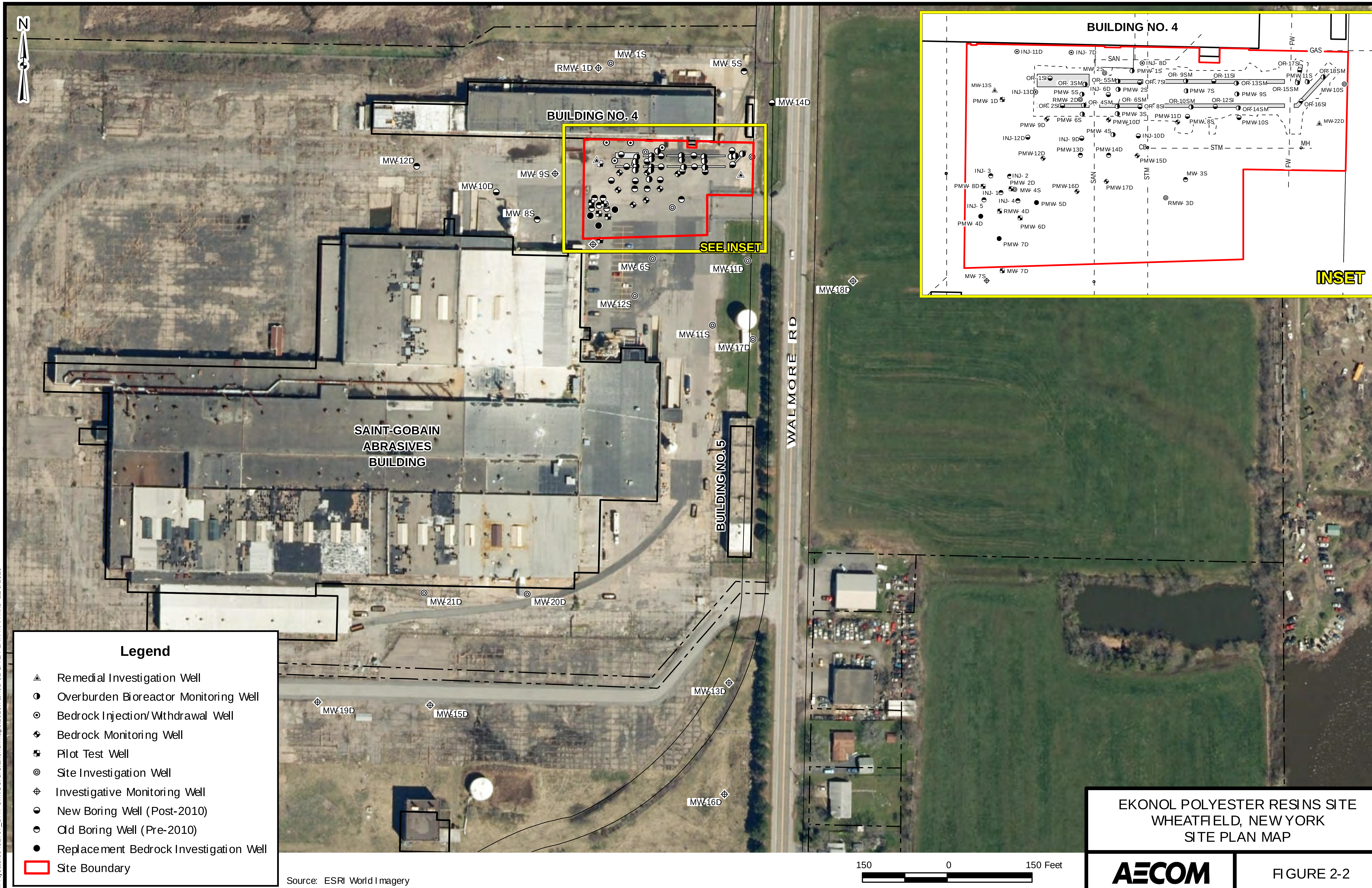


EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
BCP SITE BOUNDARY

AECOM

FIGURE 2-1

J:\Projects\60481767_BRPO.MSC\GIS\Ekonol\Maps\2020\Fall\02-01 PROPOSED SITE BOUNDARY MAP.mxd 12/10/2020



J:\Projects\60481767_BRPO\MSC\GIS\Ekonol\Maps\2020\Fall\02-02 SITE PLAN MAP.mxd 12/9/2020

Legend

- Property Boundary
- Site Boundary

Source: ESRI World Imagery

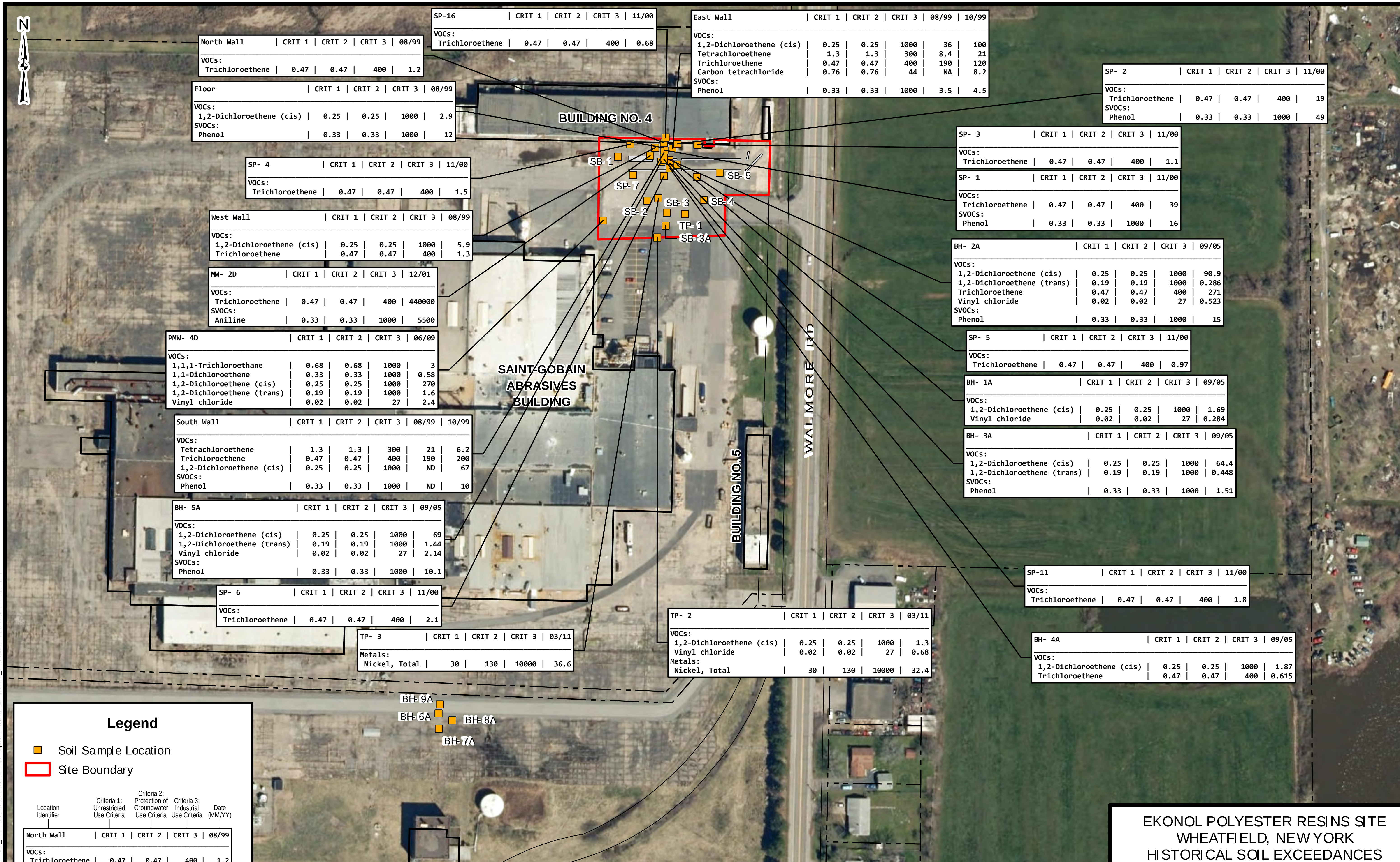
250 0 250 Feet

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
PROPERTY MAP

AECOM

FIGURE 2-3

J:\Projects\60481767_BRPO\MISC\GIS\Ekonol\Maps\2020\Fall\02-03 PROPERTY MAP.mxd 12/3/2020



North Wall	CRIT 1	CRIT 2	CRIT 3	08/99
VOCs:				
Trichloroethene	0.47	0.47	400	1.2

SP-16	CRIT 1	CRIT 2	CRIT 3	11/00
VOCs:				
Trichloroethene	0.47	0.47	400	0.68

East Wall	CRIT 1	CRIT 2	CRIT 3	08/99	10/99
VOCs:					
1,2-Dichloroethene (cis)	0.25	0.25	1000	36	100
Tetrachloroethene	1.3	1.3	300	8.4	21
Trichloroethene	0.47	0.47	400	190	120
Carbon tetrachloride	0.76	0.76	44	NA	8.2
SVOCs:					
Phenol	0.33	0.33	1000	3.5	4.5

Floor	CRIT 1	CRIT 2	CRIT 3	08/99
VOCs:				
1,2-Dichloroethene (cis)	0.25	0.25	1000	2.9
SVOCs:				
Phenol	0.33	0.33	1000	12

SP- 2	CRIT 1	CRIT 2	CRIT 3	11/00
VOCs:				
Trichloroethene	0.47	0.47	400	19
SVOCs:				
Phenol	0.33	0.33	1000	49

SP- 3	CRIT 1	CRIT 2	CRIT 3	11/00
VOCs:				
Trichloroethene	0.47	0.47	400	1.1

SP- 4	CRIT 1	CRIT 2	CRIT 3	11/00
VOCs:				
Trichloroethene	0.47	0.47	400	1.5

SP- 1	CRIT 1	CRIT 2	CRIT 3	11/00
VOCs:				
Trichloroethene	0.47	0.47	400	39
SVOCs:				
Phenol	0.33	0.33	1000	16

West Wall	CRIT 1	CRIT 2	CRIT 3	08/99
VOCs:				
1,2-Dichloroethene (cis)	0.25	0.25	1000	5.9
Trichloroethene	0.47	0.47	400	1.3

BH- 2A	CRIT 1	CRIT 2	CRIT 3	09/05
VOCs:				
1,2-Dichloroethene (cis)	0.25	0.25	1000	90.9
1,2-Dichloroethene (trans)	0.19	0.19	1000	0.286
Trichloroethene	0.47	0.47	400	271
Vinyl chloride	0.02	0.02	27	0.523
SVOCs:				
Phenol	0.33	0.33	1000	15

MW- 2D	CRIT 1	CRIT 2	CRIT 3	12/01
VOCs:				
Trichloroethene	0.47	0.47	400	440000
SVOCs:				
Aniline	0.33	0.33	1000	5500

SP- 5	CRIT 1	CRIT 2	CRIT 3	11/00
VOCs:				
Trichloroethene	0.47	0.47	400	0.97

PMW- 4D	CRIT 1	CRIT 2	CRIT 3	06/09
VOCs:				
1,1,1-Trichloroethane	0.68	0.68	1000	3
1,1-Dichloroethene	0.33	0.33	1000	0.58
1,2-Dichloroethene (cis)	0.25	0.25	1000	270
1,2-Dichloroethene (trans)	0.19	0.19	1000	1.6
Vinyl chloride	0.02	0.02	27	2.4

BH- 1A	CRIT 1	CRIT 2	CRIT 3	09/05
VOCs:				
1,2-Dichloroethene (cis)	0.25	0.25	1000	1.69
Vinyl chloride	0.02	0.02	27	0.284

South Wall	CRIT 1	CRIT 2	CRIT 3	08/99	10/99
VOCs:					
Tetrachloroethene	1.3	1.3	300	21	6.2
Trichloroethene	0.47	0.47	400	190	200
1,2-Dichloroethene (cis)	0.25	0.25	1000	ND	67
SVOCs:					
Phenol	0.33	0.33	1000	ND	10

BH- 3A	CRIT 1	CRIT 2	CRIT 3	09/05
VOCs:				
1,2-Dichloroethene (cis)	0.25	0.25	1000	64.4
1,2-Dichloroethene (trans)	0.19	0.19	1000	0.448
SVOCs:				
Phenol	0.33	0.33	1000	1.51

BH- 5A	CRIT 1	CRIT 2	CRIT 3	09/05
VOCs:				
1,2-Dichloroethene (cis)	0.25	0.25	1000	69
1,2-Dichloroethene (trans)	0.19	0.19	1000	1.44
Vinyl chloride	0.02	0.02	27	2.14
SVOCs:				
Phenol	0.33	0.33	1000	10.1

SP-11	CRIT 1	CRIT 2	CRIT 3	11/00
VOCs:				
Trichloroethene	0.47	0.47	400	1.8

SP- 6	CRIT 1	CRIT 2	CRIT 3	11/00
VOCs:				
Trichloroethene	0.47	0.47	400	2.1

TP- 2	CRIT 1	CRIT 2	CRIT 3	03/11
VOCs:				
1,2-Dichloroethene (cis)	0.25	0.25	1000	1.3
Vinyl chloride	0.02	0.02	27	0.68
Metals:				
Nickel, Total	30	130	10000	32.4

TP- 3	CRIT 1	CRIT 2	CRIT 3	03/11
Metals:				
Nickel, Total	30	130	10000	36.6

BH- 4A	CRIT 1	CRIT 2	CRIT 3	09/05
VOCs:				
1,2-Dichloroethene (cis)	0.25	0.25	1000	1.87
Trichloroethene	0.47	0.47	400	0.615

Legend

Soil Sample Location

Site Boundary

Location Identifier; Criteria 1: Unrestricted Use Criteria; Criteria 2: Protection of Groundwater Use Criteria; Criteria 3: Industrial Use Criteria; Date (MM/YY)

North Wall	CRIT 1	CRIT 2	CRIT 3	08/99
VOCs:				
Trichloroethene	0.47	0.47	400	1.2

Compound; Concentration (mg/kg)

Notes: NA = Not Analyzed; ND = Not Detected

Source: ESRI World Imagery

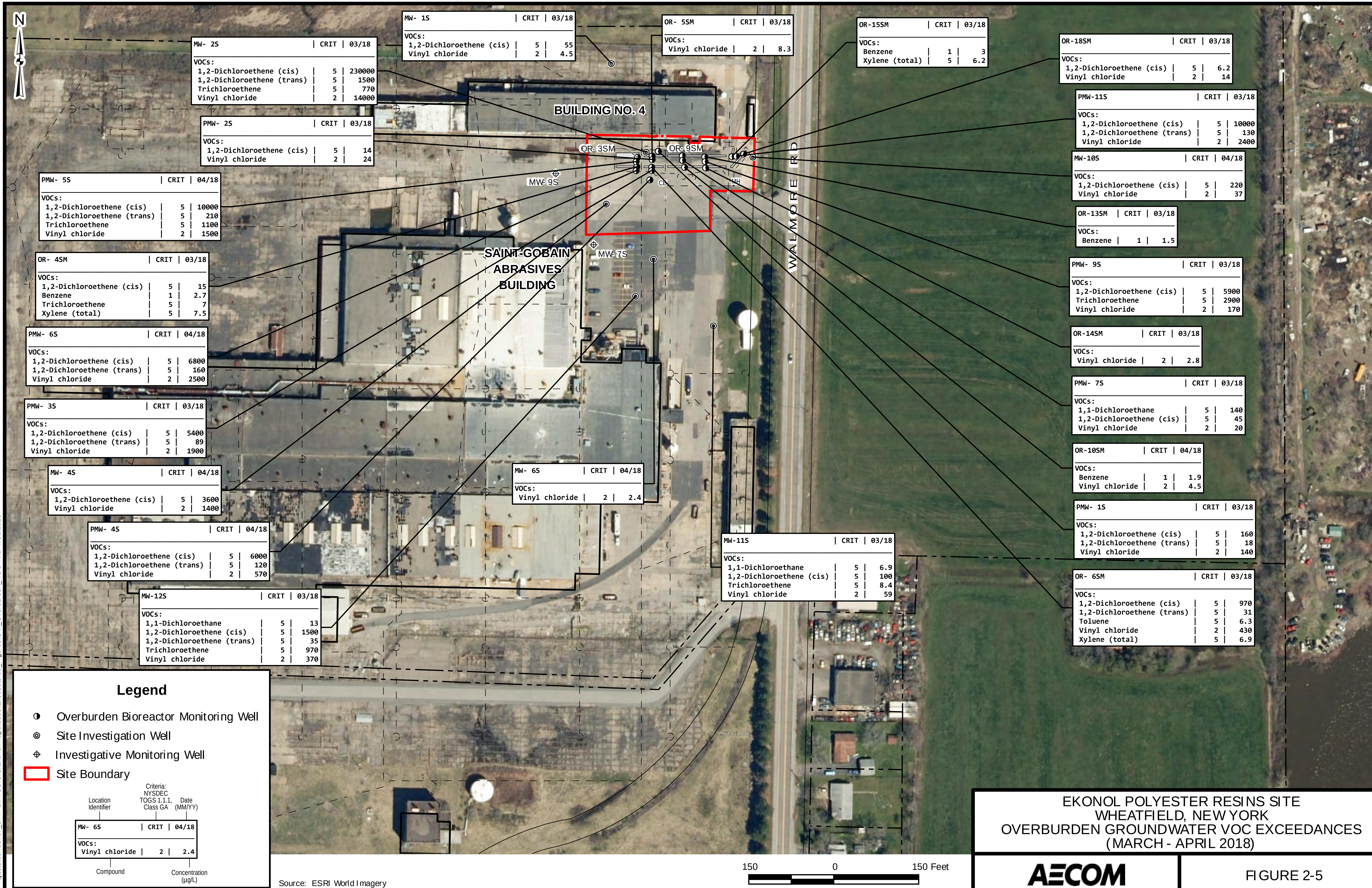
150 0 150 Feet

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
HISTORICAL SOIL EXCEEDANCES

AECOM

FIGURE 2-4

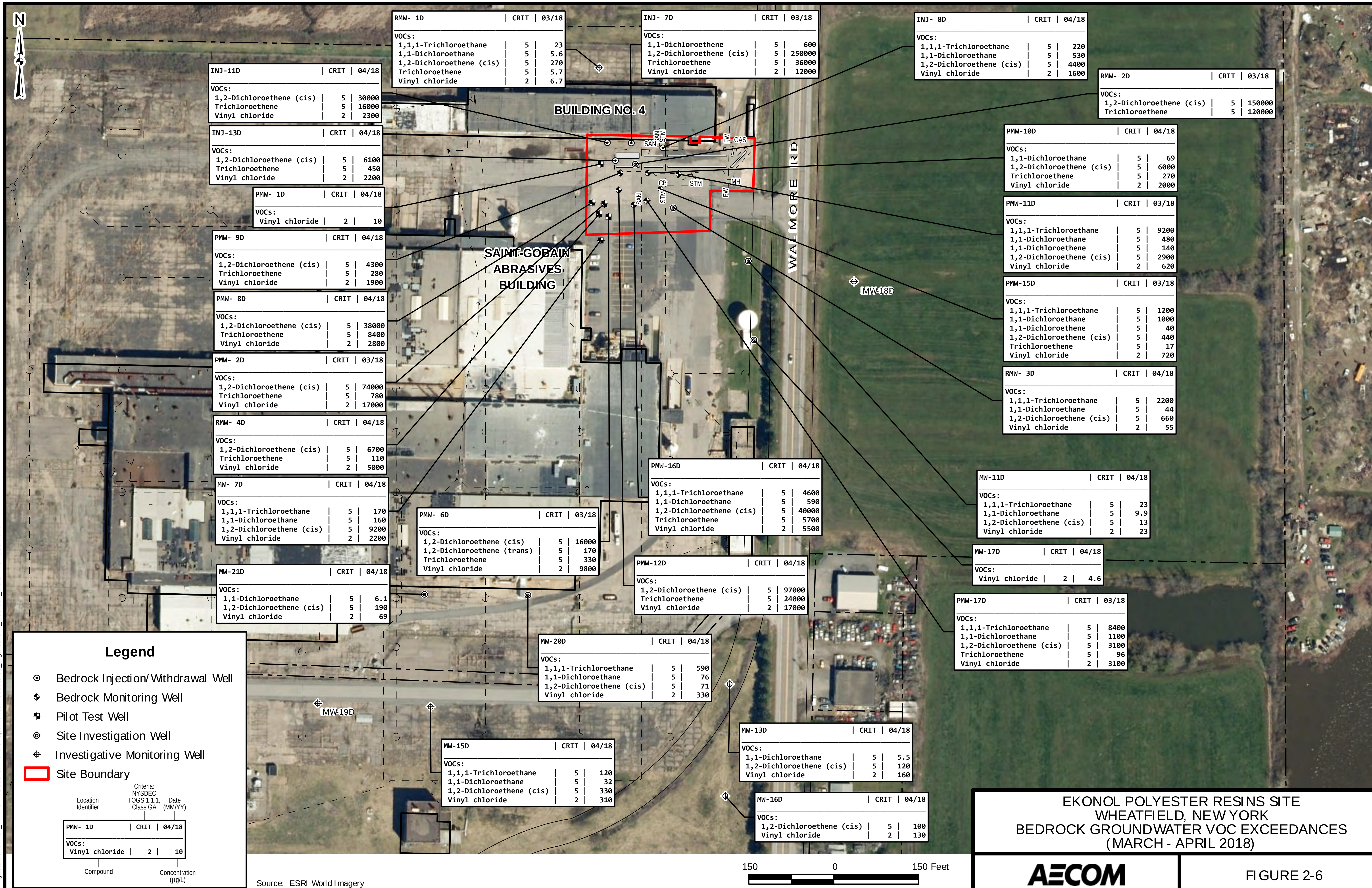
J:\Projects\60481767_BRPOMS\GIS\GIS\Ekonol\Maps\2020\Fall\02-04 SO_Exceedances.mxd 12/15/2020



EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
OVERBURDEN GROUNDWATER VOC EXCEEDANCES
(MARCH - APRIL 2018)

AECOM

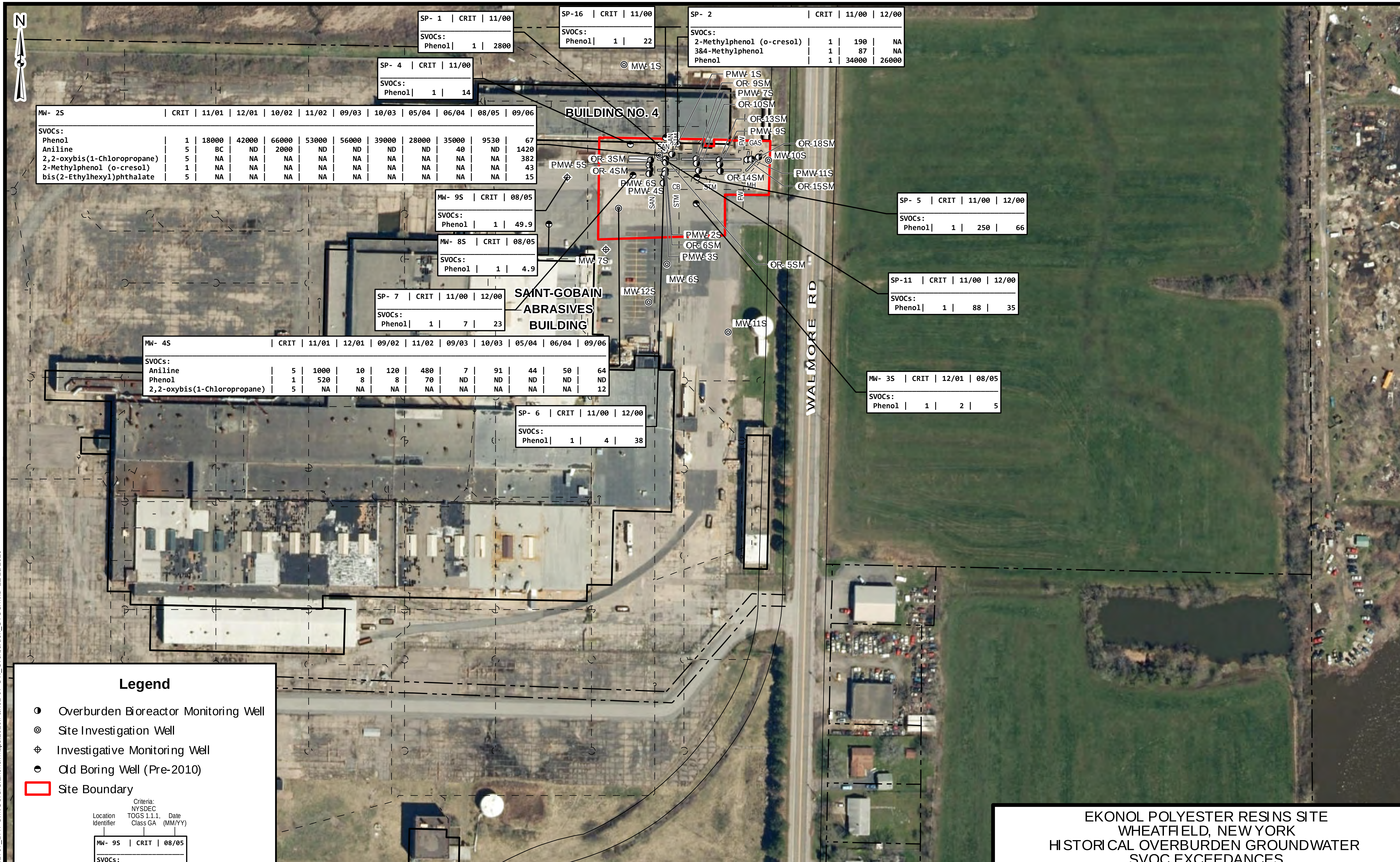
FIGURE 2-5



EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
BEDROCK GROUNDWATER VOC EXCEEDANCES
(MARCH - APRIL 2018)

AECOM

FIGURE 2-6



MW- 2S	CRIT	11/01	12/01	10/02	11/02	09/03	10/03	05/04	06/04	08/05	09/06
SVOCs:											
Phenol	1	18000	42000	66000	53000	56000	39000	28000	35000	9530	67
Aniline	5	BC	ND	2000	ND	ND	ND	ND	40	ND	1420
2,2-oxybis(1-Chloropropane)	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	382
2-Methylphenol (o-cresol)	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	43
bis(2-Ethylhexyl)phthalate	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	15

SP- 1	CRIT	11/00
SVOCs:		
Phenol	1	2800

SP-16	CRIT	11/00
SVOCs:		
Phenol	1	22

SP- 2	CRIT	11/00	12/00
SVOCs:			
2-Methylphenol (o-cresol)	1	190	NA
3&4-Methylphenol	1	87	NA
Phenol	1	34000	26000

SP- 4	CRIT	11/00
SVOCs:		
Phenol	1	14

MW- 9S	CRIT	08/05
SVOCs:		
Phenol	1	49.9

MW- 8S	CRIT	08/05
SVOCs:		
Phenol	1	4.9

SP- 5	CRIT	11/00	12/00
SVOCs:			
Phenol	1	250	66

SP-11	CRIT	11/00	12/00
SVOCs:			
Phenol	1	88	35

SP- 7	CRIT	11/00	12/00
SVOCs:			
Phenol	1	7	23

MW- 4S	CRIT	11/01	12/01	09/02	11/02	09/03	10/03	05/04	06/04	09/06
SVOCs:										
Aniline	5	1000	10	120	480	7	91	44	50	64
Phenol	1	520	8	8	70	ND	ND	ND	ND	ND
2,2-oxybis(1-Chloropropane)	5	NA	NA	NA	NA	NA	NA	NA	NA	12

MW- 3S	CRIT	12/01	08/05
SVOCs:			
Phenol	1	2	5

SP- 6	CRIT	11/00	12/00
SVOCs:			
Phenol	1	4	38

Legend

- Overburden Bioreactor Monitoring Well
- Site Investigation Well
- Investigative Monitoring Well
- Old Boring Well (Pre-2010)
- Site Boundary

Location Identifier; Criteria: NYSDEC TOGS 1.1.1, Class GA; Date (MM/YY)

MW- 9S	CRIT	08/05
SVOCs:		
Phenol	1	49.9

Compound; Concentration (µg/L)

Notes: NA = Not Analyzed; ND = Not Detected

Source: ESRI World Imagery

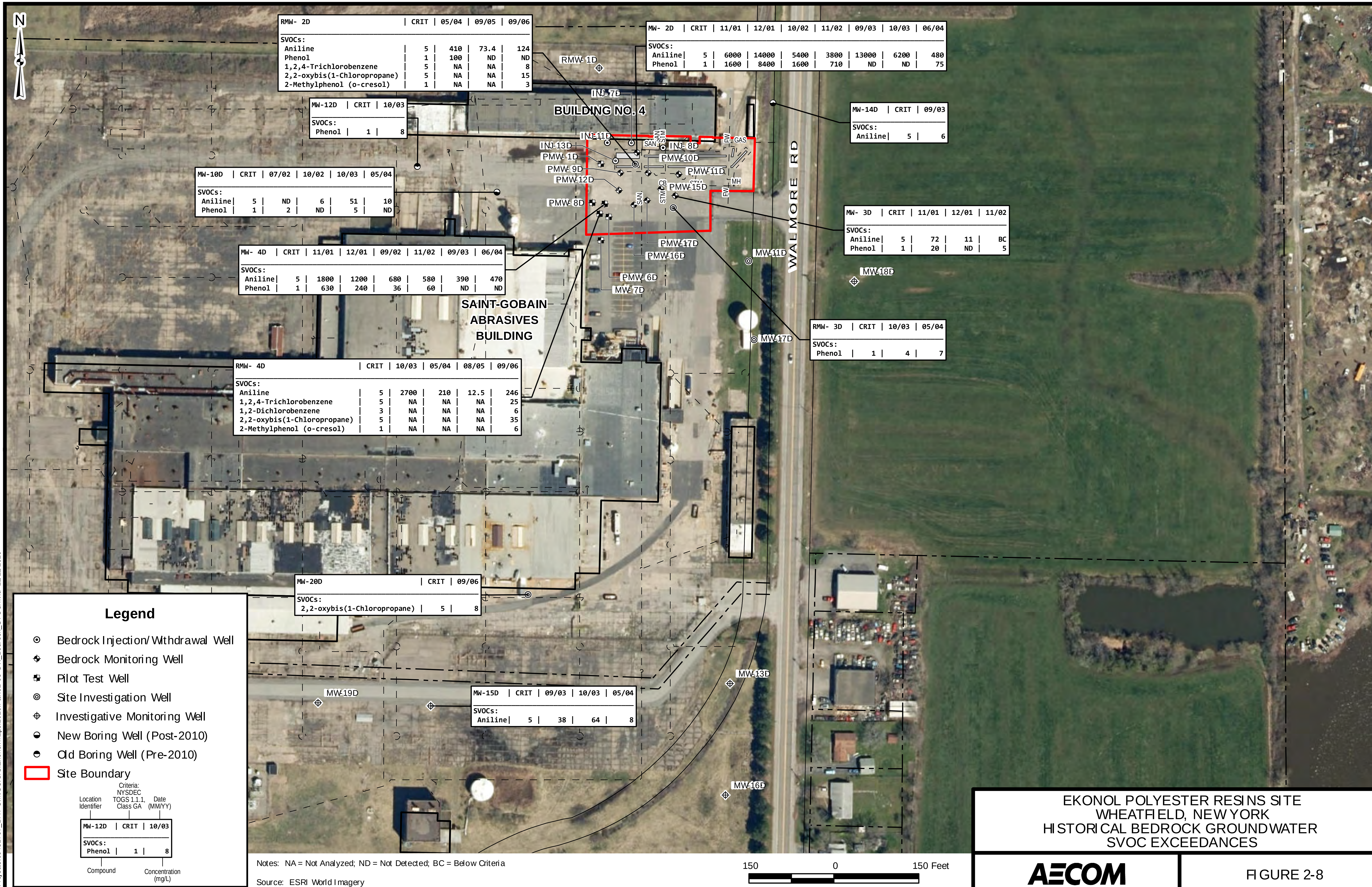
150 0 150 Feet

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
HISTORICAL OVERBURDEN GROUNDWATER
SVOC EXCEEDANCES

AECOM

FIGURE 2-7

J:\Projects\60481767_BRP\O M S\GIS\Ekonol\Maps\2020\Fall\02-07 GW_Overburden_SVOC.mxd 12/15/2020



RMW- 2D	CRIT	05/04	09/05	09/06
SVOCs:				
Aniline	5	410	73.4	124
Phenol	1	100	ND	ND
1,2,4-Trichlorobenzene	5	NA	NA	8
2,2-oxybis(1-Chloropropane)	5	NA	NA	15
2-Methylphenol (o-cresol)	1	NA	NA	3

MW- 2D	CRIT	11/01	12/01	10/02	11/02	09/03	10/03	06/04
SVOCs:								
Aniline	5	6000	14000	5400	3800	13000	6200	480
Phenol	1	1600	8400	1600	710	ND	ND	75

MW-12D	CRIT	10/03
SVOCs:		
Phenol	1	8

MW-14D	CRIT	09/03
SVOCs:		
Aniline	5	6

MW-10D	CRIT	07/02	10/02	10/03	05/04
SVOCs:					
Aniline	5	ND	6	51	10
Phenol	1	2	ND	5	ND

MW- 3D	CRIT	11/01	12/01	11/02
SVOCs:				
Aniline	5	72	11	BC
Phenol	1	20	ND	5

MW- 4D	CRIT	11/01	12/01	09/02	11/02	09/03	06/04
SVOCs:							
Aniline	5	1800	1200	680	580	390	470
Phenol	1	630	240	36	60	ND	ND

RMW- 3D	CRIT	10/03	05/04
SVOCs:			
Phenol	1	4	7

RMW- 4D	CRIT	10/03	05/04	08/05	09/06
SVOCs:					
Aniline	5	2700	210	12.5	246
1,2,4-Trichlorobenzene	5	NA	NA	NA	25
1,2-Dichlorobenzene	3	NA	NA	NA	6
2,2-oxybis(1-Chloropropane)	5	NA	NA	NA	35
2-Methylphenol (o-cresol)	1	NA	NA	NA	6

MW-20D	CRIT	09/06
SVOCs:		
2,2-oxybis(1-Chloropropane)	5	8

MW-15D	CRIT	09/03	10/03	05/04
SVOCs:				
Aniline	5	38	64	8

MW-12D	CRIT	10/03
SVOCs:		
Phenol	1	8

Notes: NA = Not Analyzed; ND = Not Detected; BC = Below Criteria

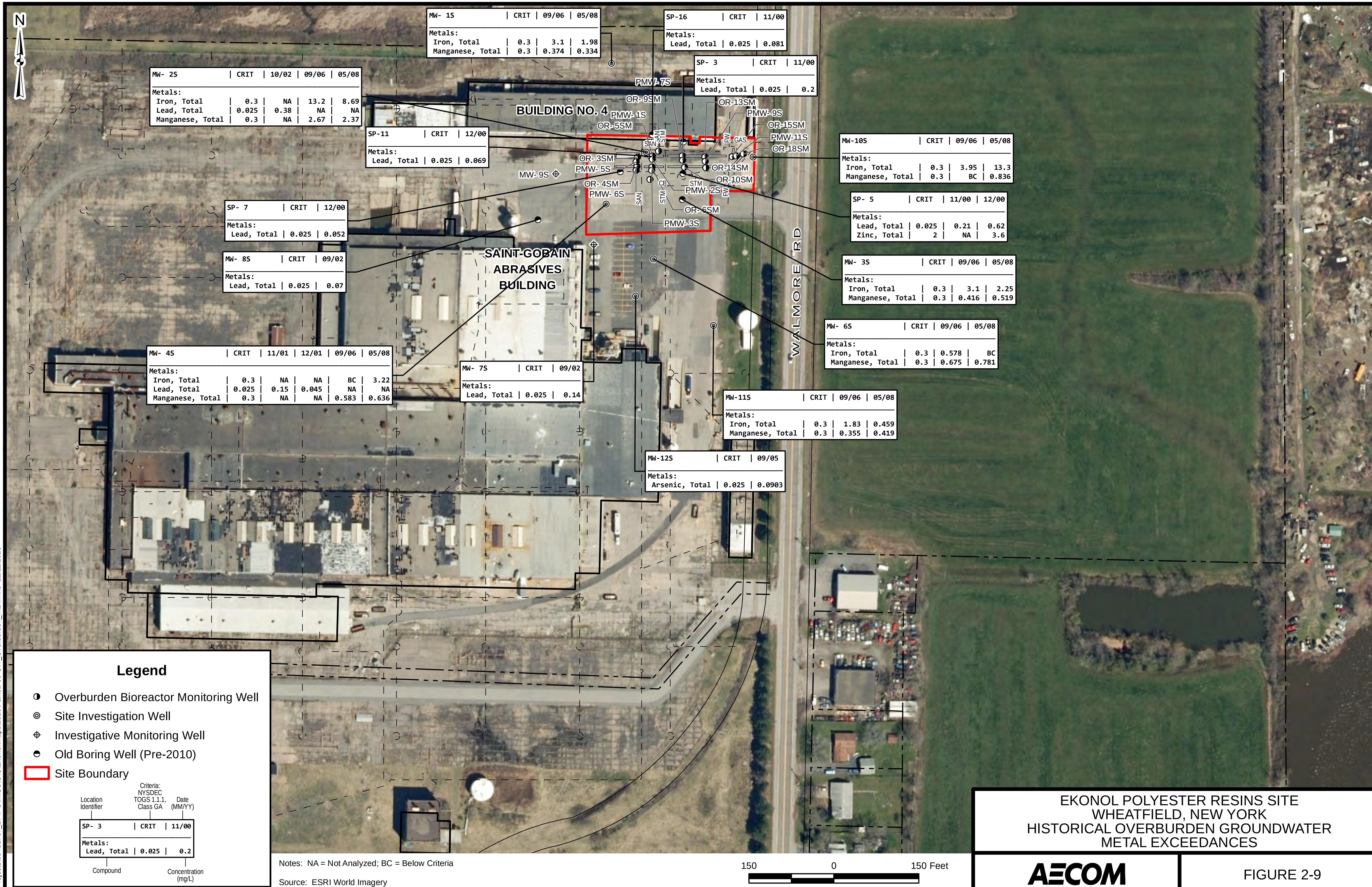
Source: ESRI World Imagery

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
HISTORICAL BEDROCK GROUNDWATER
SVOC EXCEEDANCES

AECOM

FIGURE 2-8

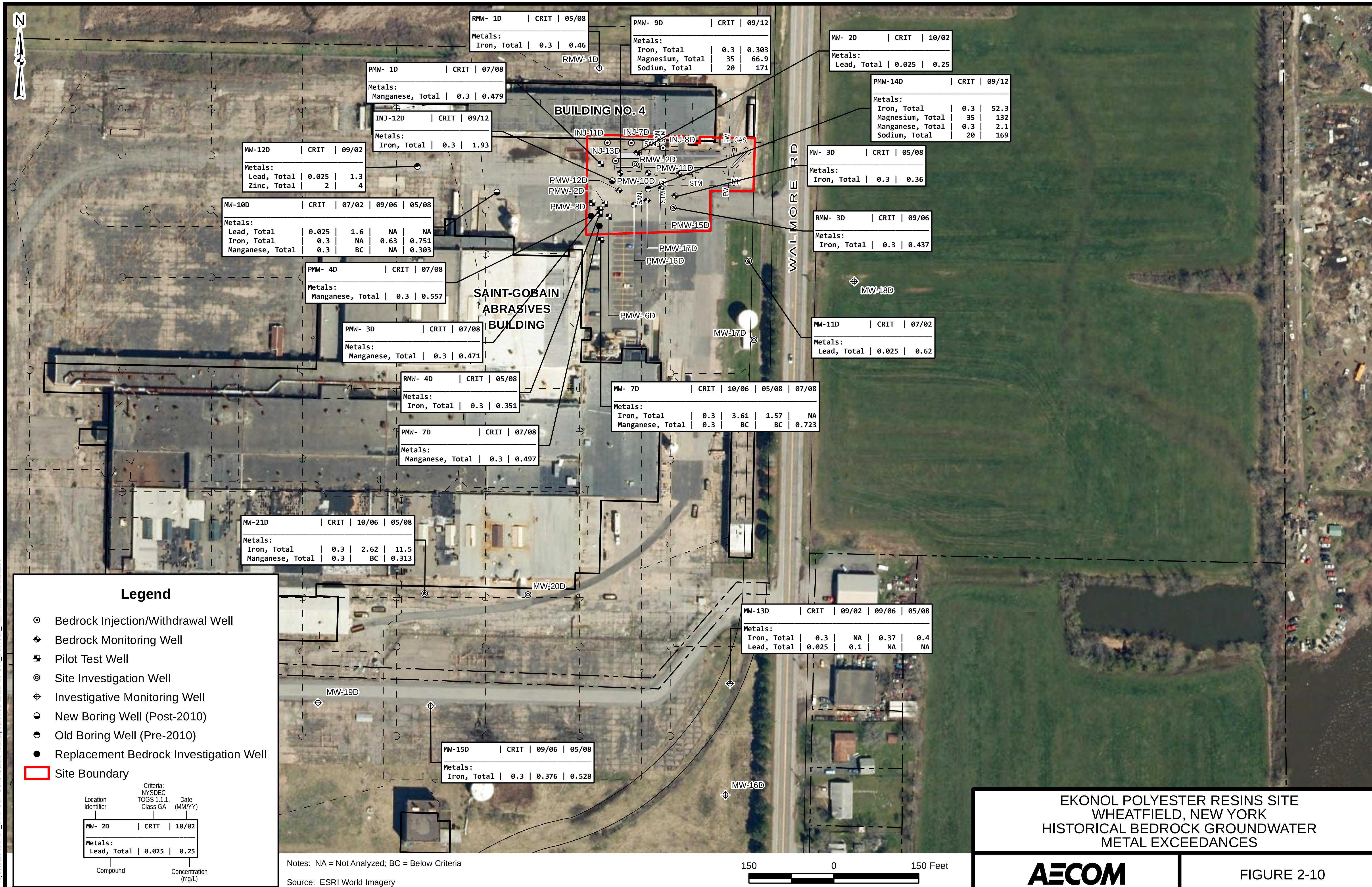
J:\Projects\60481767_BRPOMSC\GIS\Ekonol\Maps\2020\Fall\02-08 GW_Bedrock_SVOC.mxd 12/11/2020



EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
HISTORICAL OVERBURDEN GROUNDWATER
METAL EXCEEDANCES

AECOM

FIGURE 2-9



Notes: NA = Not Analyzed; BC = Below Criteria

Source: ESRI World Imagery

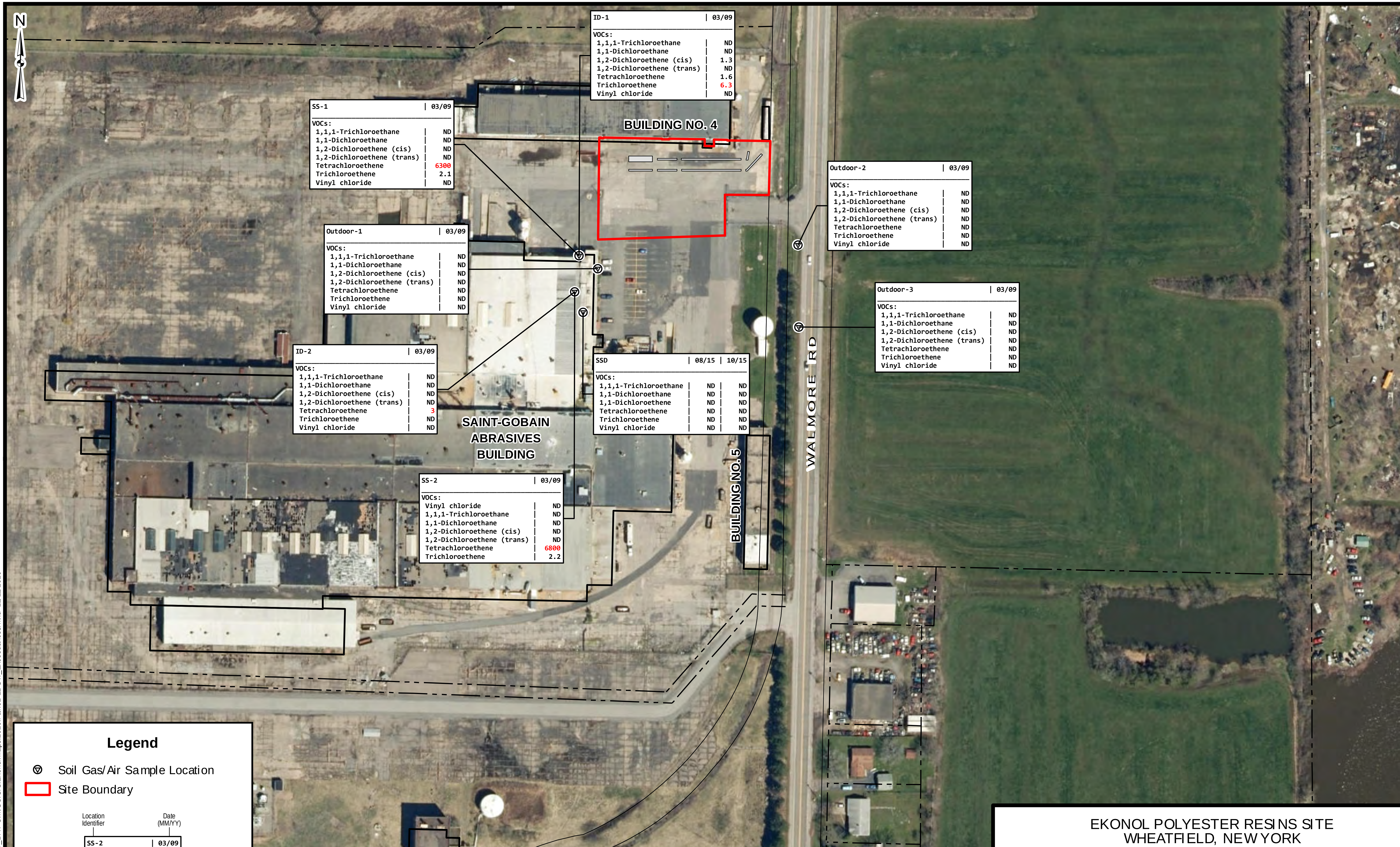
150 0 150 Feet

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
HISTORICAL BEDROCK GROUNDWATER
METAL EXCEEDANCES

AECOM

FIGURE 2-10

J:\Projects\60481767_BPIPO\MISC\GIS\Ekonol\Maps\2020\Fall\02-10 GW_Bedrock_MET.mxd 12/11/2020



J:\Projects\60481767_BP\PO\MSC\GIS\Ekonol\Maps\2020\Fall\02-11 SVI_Exceedances.mxd 12/11/2020

Legend

- Soil Gas/Air Sample Location
- Site Boundary

Location Identifier — Date (MM/YY)

SS-2 | 03/09
VOCs:
Vinyl chloride | ND

Compound — Concentration (µg/m3)

Notes:
1. Subslab and indoor air samples compared to May 2017 updates to soil vapor/indoor air decision matrices for the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in New York State. October, 2006. Values shown in red required mitigation according to the decision matrices.
2. ND = Not Detected

Source: ESRI World Imagery

150 0 150 Feet

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
HISTORICAL SOIL GAS/AIR SAMPLE RESULTS

AECOM

FIGURE 2-11

Legend

- RI Soil Sample Location
- Site Boundary

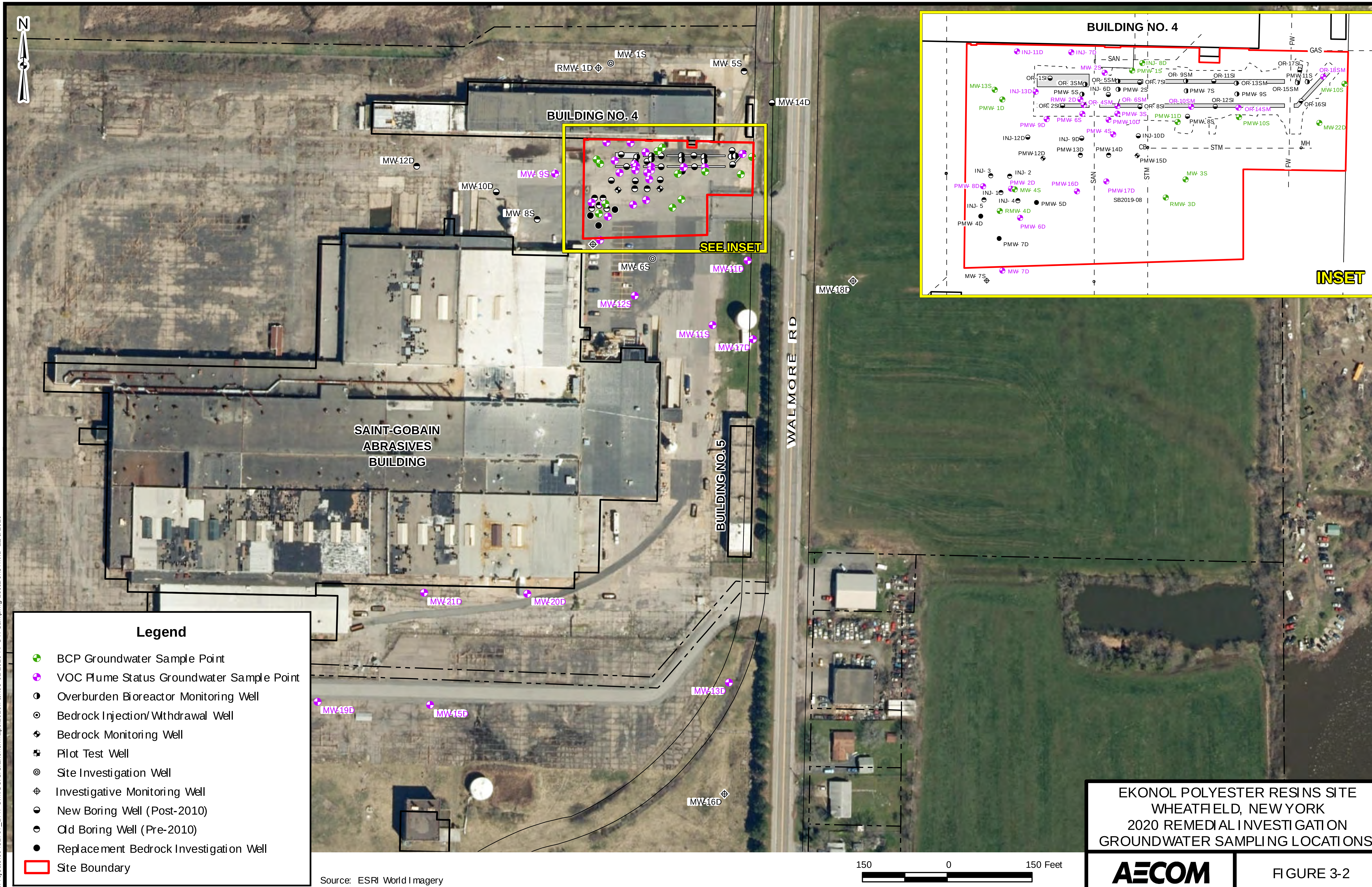
Source: ESRI World Imagery

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
2020 REMEDIAL INVESTIGATION
SOIL SAMPLING LOCATIONS

AECOM

FIGURE 3-1

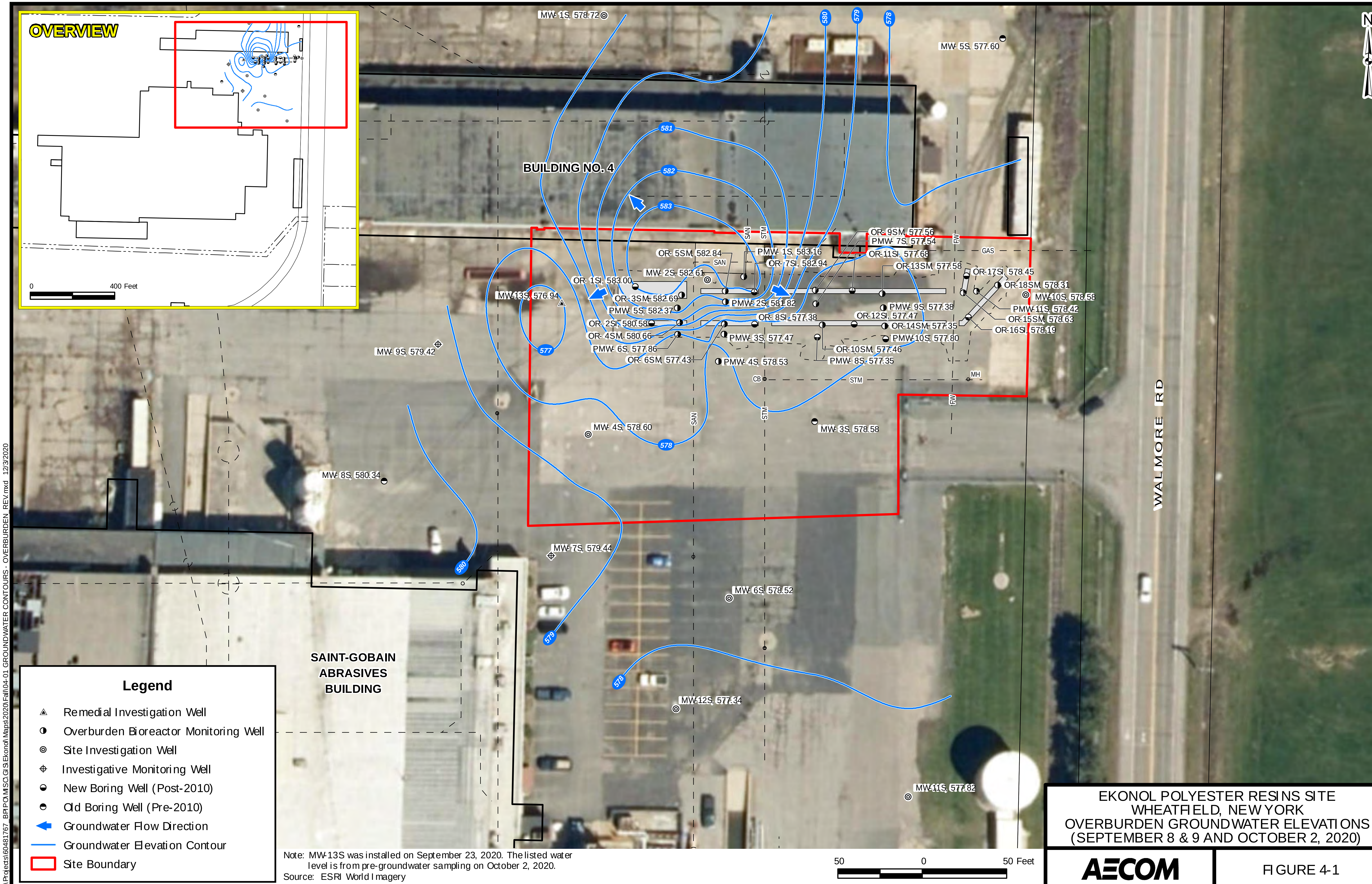
J:\Projects\60481767_BPIPO\MISC\GIS\Ekonol\Maps\2020\Fall\03-01 2020 RI Soil Sampling Locations.mxd 12/9/2020



EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
2020 REMEDIAL INVESTIGATION
GROUNDWATER SAMPLING LOCATIONS

FIGURE 3-2

J:\Projects\60481767_BRPOMSCGIS\Ekonol\Maps\2020\Fall\03-02 2020 RI GW Sampling Locations.mxd 12/9/2020



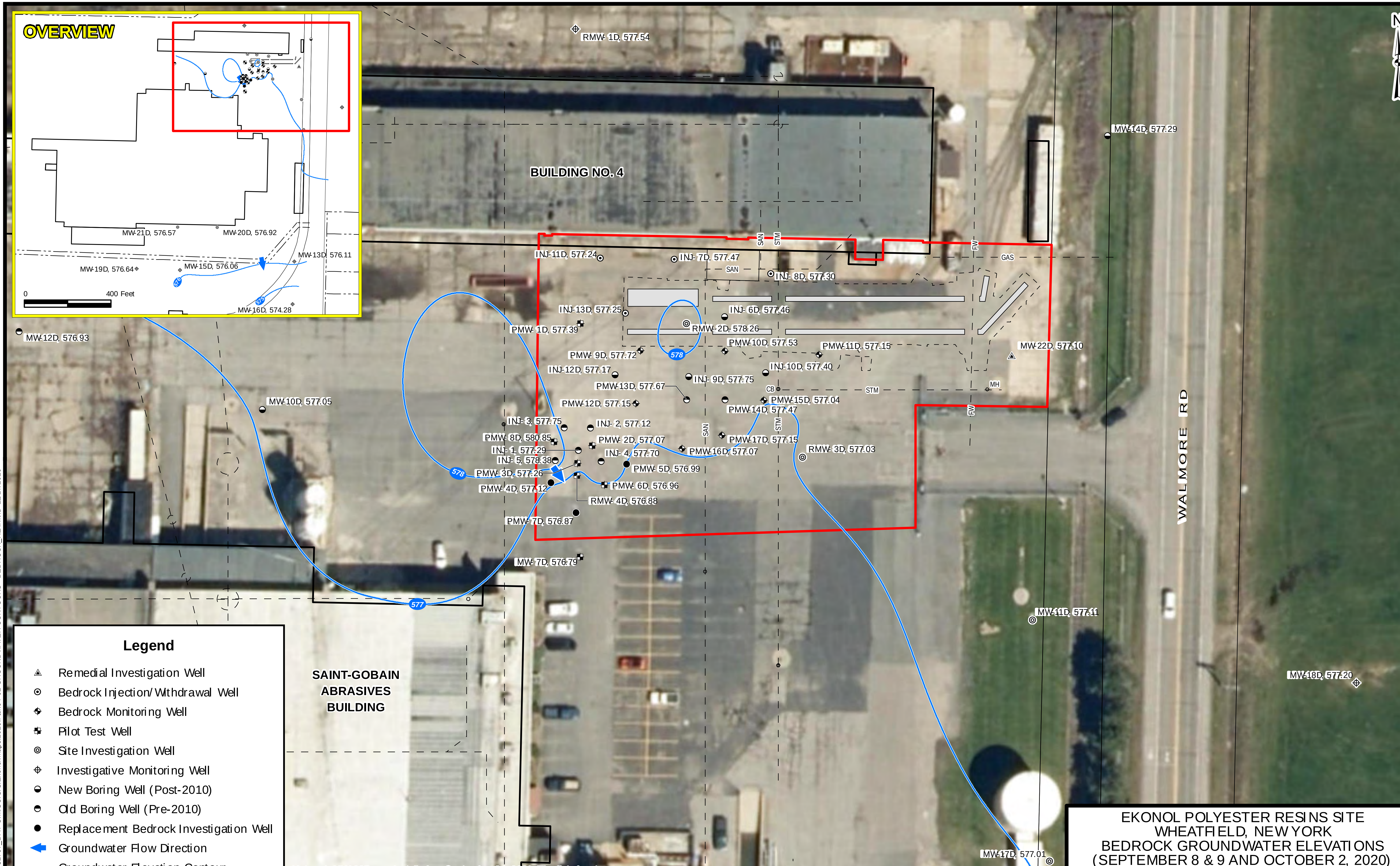
Note: MW-13S was installed on September 23, 2020. The listed water level is from pre-groundwater sampling on October 2, 2020.

Source: ESRI World Imagery

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
OVERBURDEN GROUNDWATER ELEVATIONS
(SEPTEMBER 8 & 9 AND OCTOBER 2, 2020)

AECOM

FIGURE 4-1



Legend

- Remedial Investigation Well
- Bedrock Injection/Withdrawal Well
- Bedrock Monitoring Well
- Pilot Test Well
- Site Investigation Well
- Investigative Monitoring Well
- New Boring Well (Post-2010)
- Old Boring Well (Pre-2010)
- Replacement Bedrock Investigation Well
- Groundwater Flow Direction
- Groundwater Elevation Contour
- Site Boundary

Notes: 1. MW-22D was installed on September 24, 2020. The listed water level is from pre-groundwater sampling on October 2, 2020.
2. PMW-8D was not used in the generation of contours due to an anomalously high water elevation.

Source: ESRI World Imagery

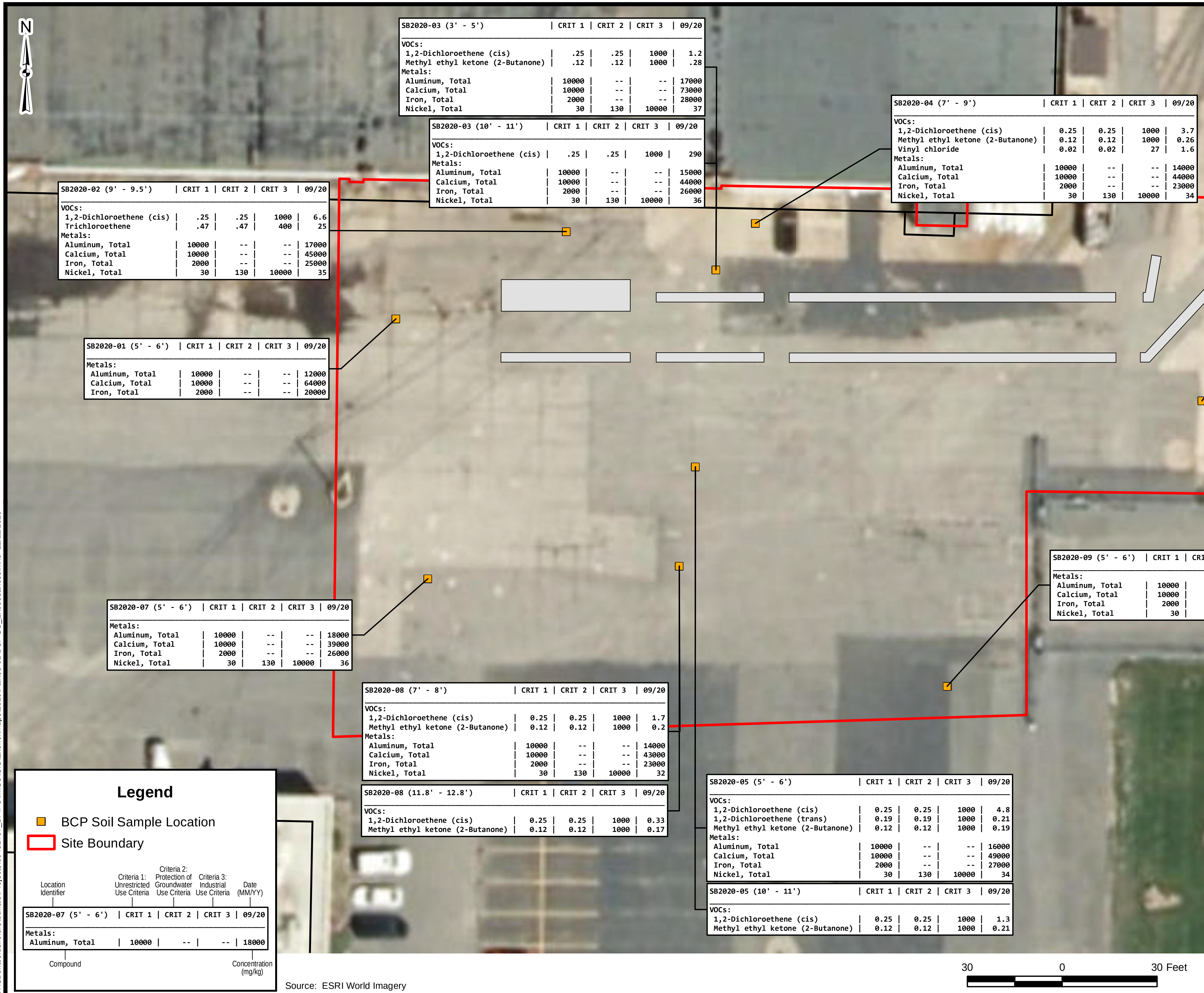
50 0 50 Feet

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
BEDROCK GROUNDWATER ELEVATIONS
(SEPTEMBER 8 & 9 AND OCTOBER 2, 2020)

AECOM

FIGURE 4-2

J:\Projects\60481767_BRPO\MISC\GIS\Ekonol\Maps\2020\Fall\04-02 GROUNDWATER CONTOURS - BEDROCK_REV.mxd 12/17/2020

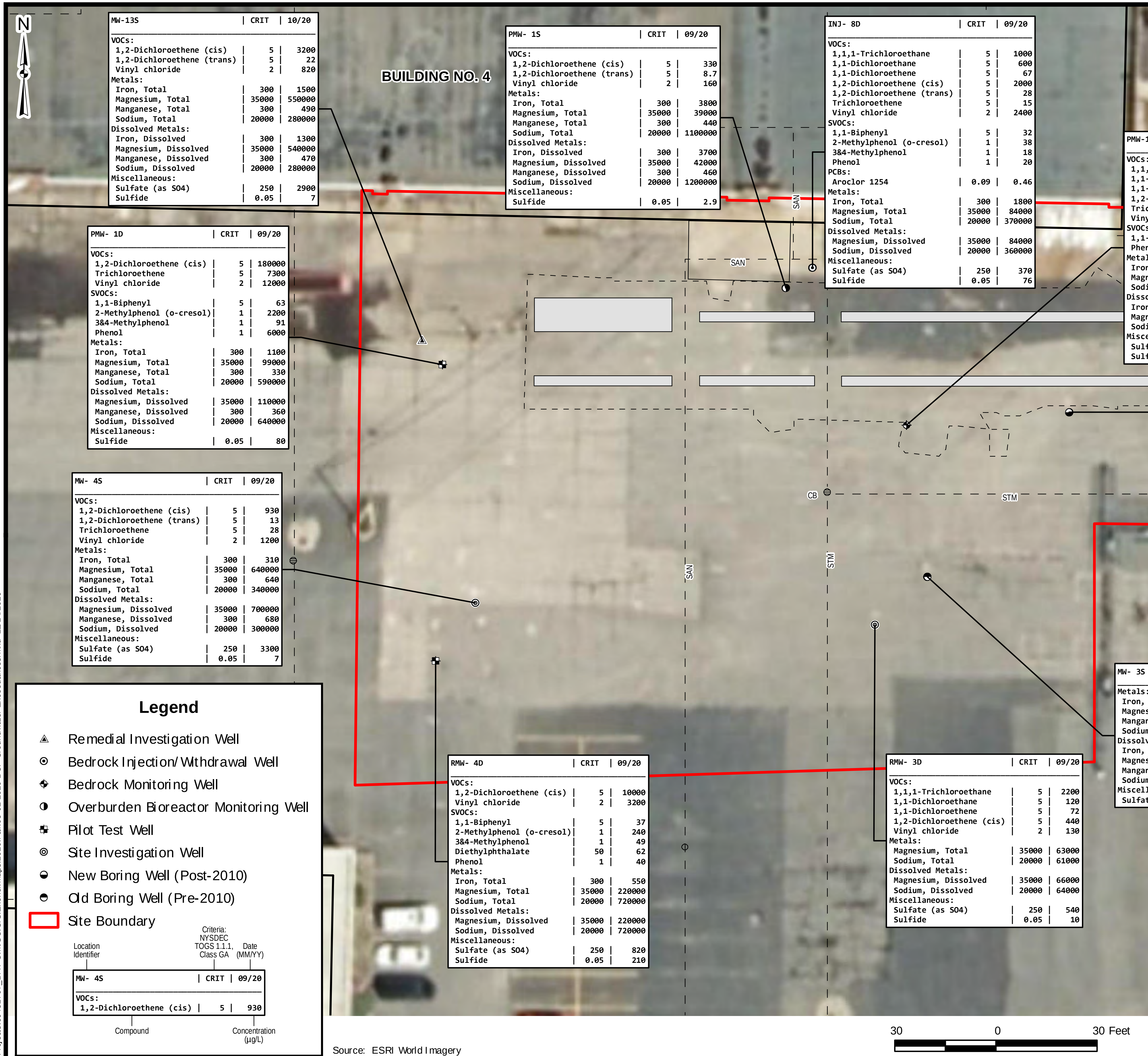


EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
2020 BCP SOIL EXCEEDANCES

AECOM

FIGURE 5-1

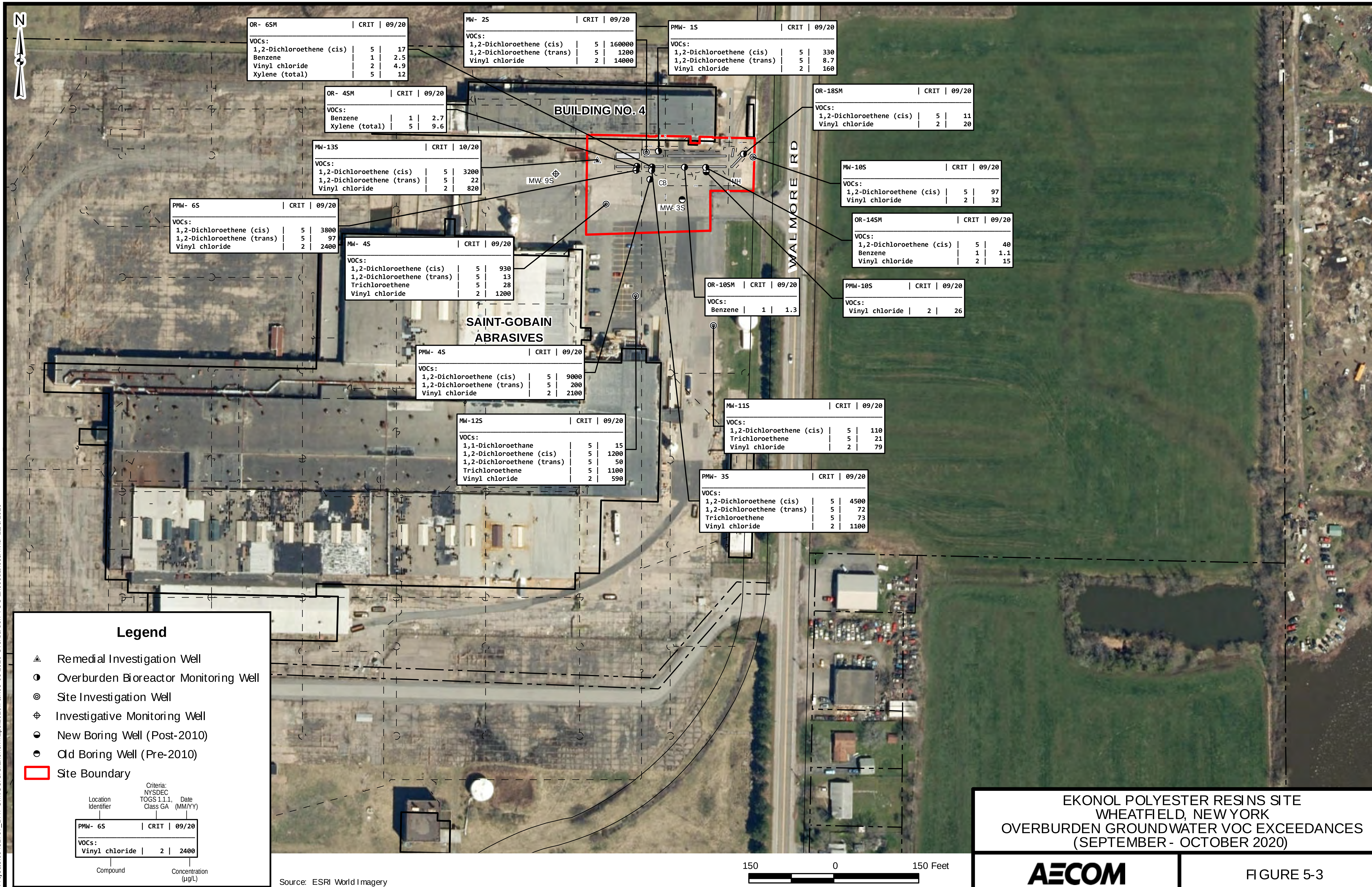
\\URSBuffalo.us.ie.urs\Buffalo\Projects\60481767_BP\POM\ISC\GIS\Ekonol\Maps\2020\Fall\05-01 BCP SO_Exceedances.mxd 12/11/2020



EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
2020 BCP GROUNDWATER EXCEEDANCES

AECOM

FIGURE 5-2

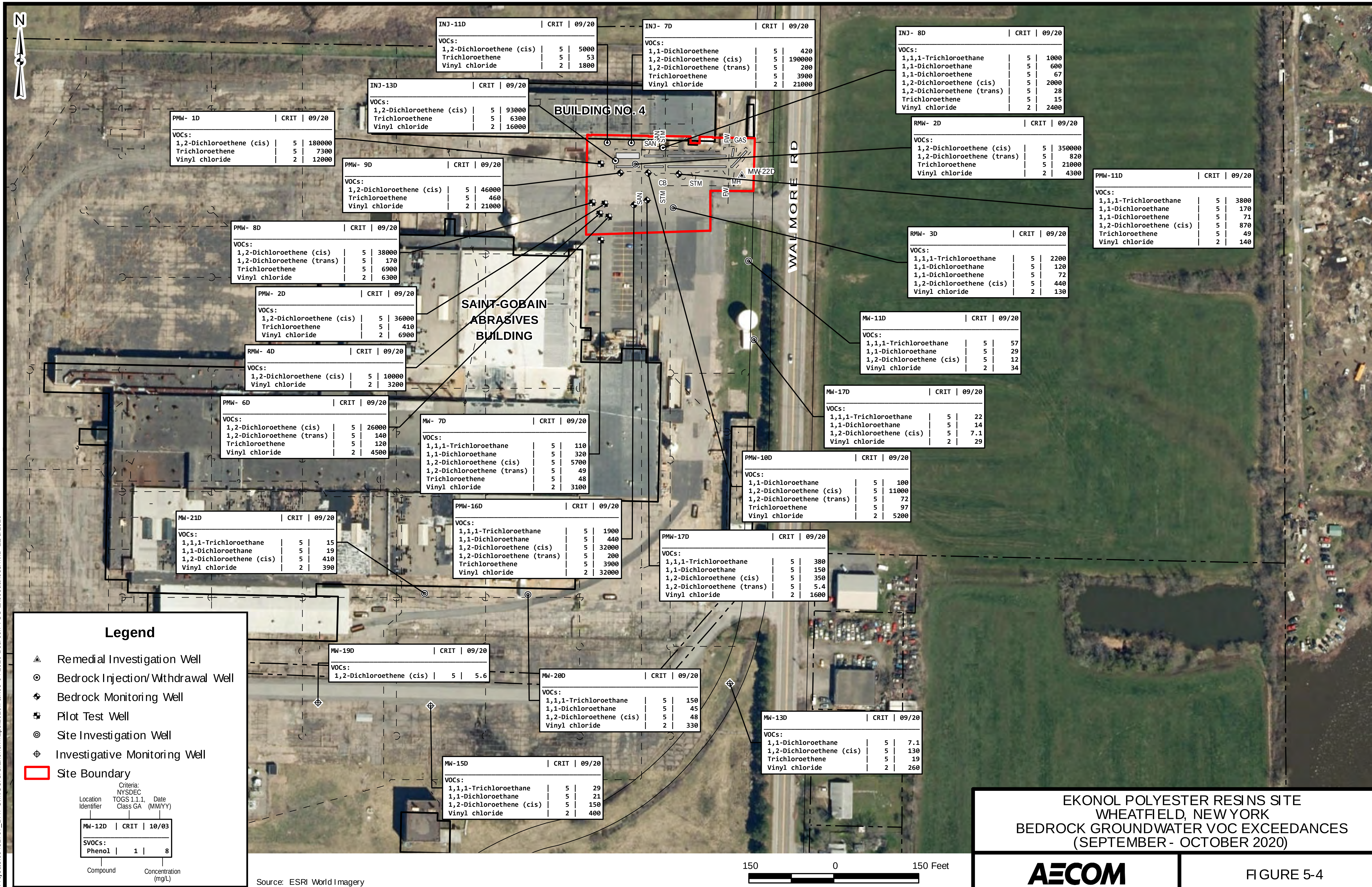


EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
OVERBURDEN GROUNDWATER VOC EXCEEDANCES
(SEPTEMBER - OCTOBER 2020)

AECOM

FIGURE 5-3

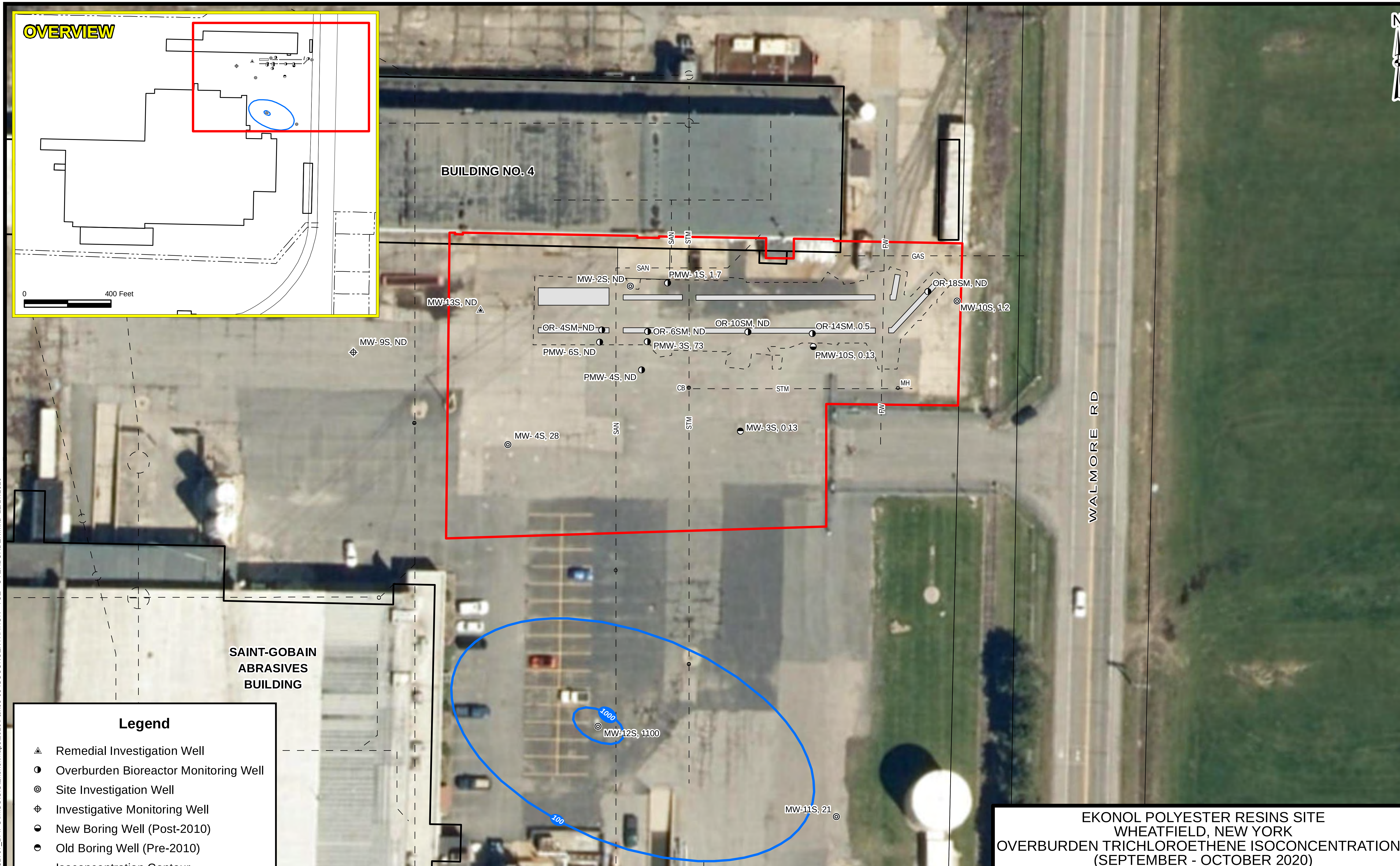
J:\Projects\60481767_BRPO\MSC\GIS\Ekonol\Maps\2020\Fall\05-03 2020 Overburden VOC Exceedances.mxd 12/9/2020



EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
BEDROCK GROUNDWATER VOC EXCEEDANCES
(SEPTEMBER - OCTOBER 2020)

AECOM

FIGURE 5-4



Legend

- Remedial Investigation Well
- Overburden Bioreactor Monitoring Well
- Site Investigation Well
- Investigative Monitoring Well
- New Boring Well (Post-2010)
- Old Boring Well (Pre-2010)
- Isoconcentration Contour
- Site Boundary

Notes:
1. Criteria = 5 µg/L, as per NYSDEC TOGS 1.1.1 Ambient Water Quality Standards, Class GA
2. Units are shown in µg/L
3. ND = Not Detected

Source:
ESRI World Imagery

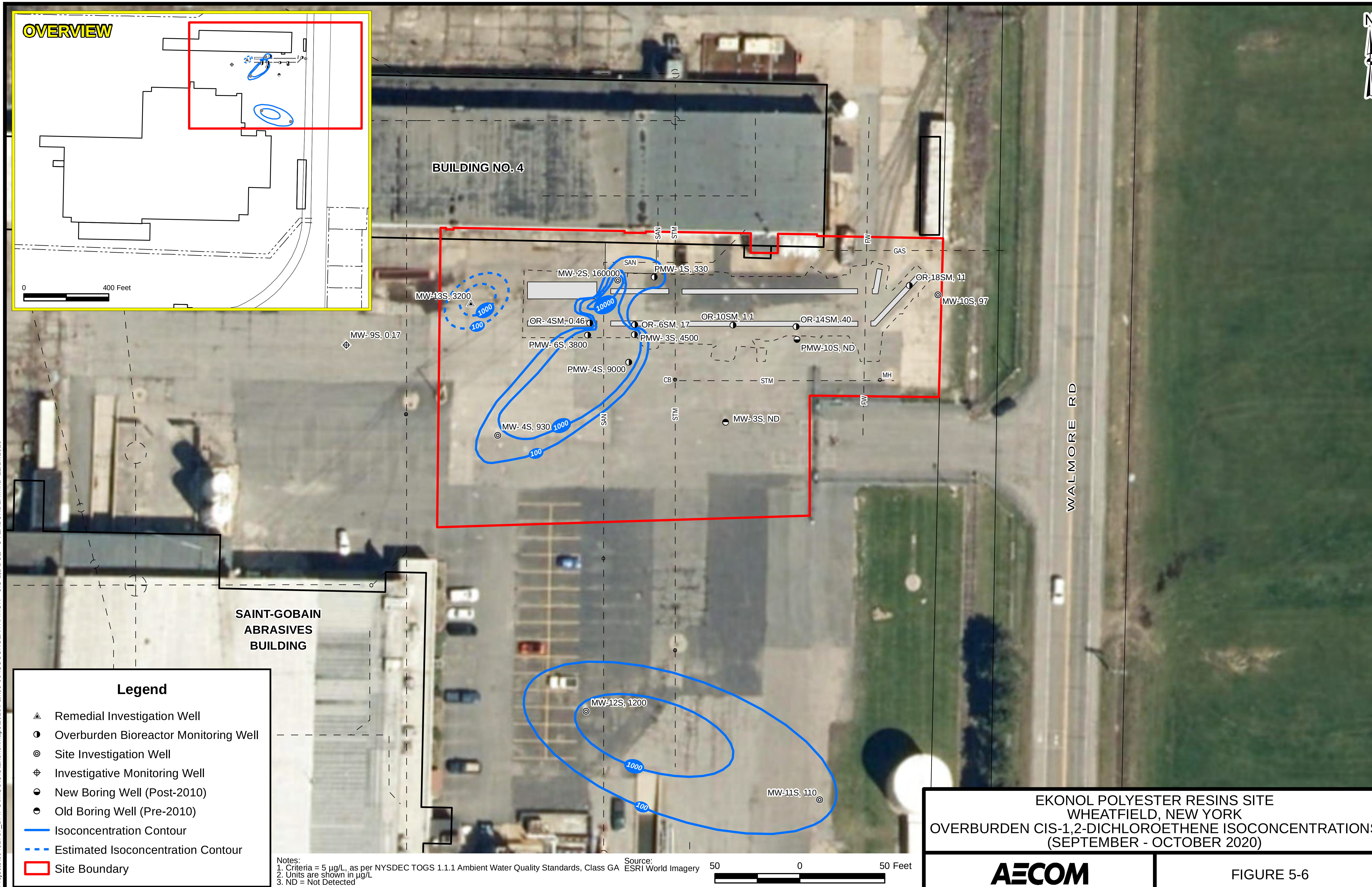
50 0 50 Feet

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
OVERBURDEN TRICHLOROETHENE ISOCONCENTRATIONS
(SEPTEMBER - OCTOBER 2020)

AECOM

FIGURE 5-5

J:\Projects\60481767_BPIPOIMISC\GIS\Ekonol\Maps\2020\Fall\05-05 ISOCONCENTRATION - TCE - OVERBURDEN.mxd 12/17/2020



Legend

- Remedial Investigation Well
- Overburden Bioreactor Monitoring Well
- Site Investigation Well
- Investigative Monitoring Well
- New Boring Well (Post-2010)
- Old Boring Well (Pre-2010)
- Isoconcentration Contour
- Estimated Isoconcentration Contour
- Site Boundary

Notes:
1. Criteria = 5 µg/L, as per NYSDEC TOGS 1.1.1 Ambient Water Quality Standards, Class GA
2. Units are shown in µg/L
3. ND = Not Detected

Source:
ESRI World Imagery

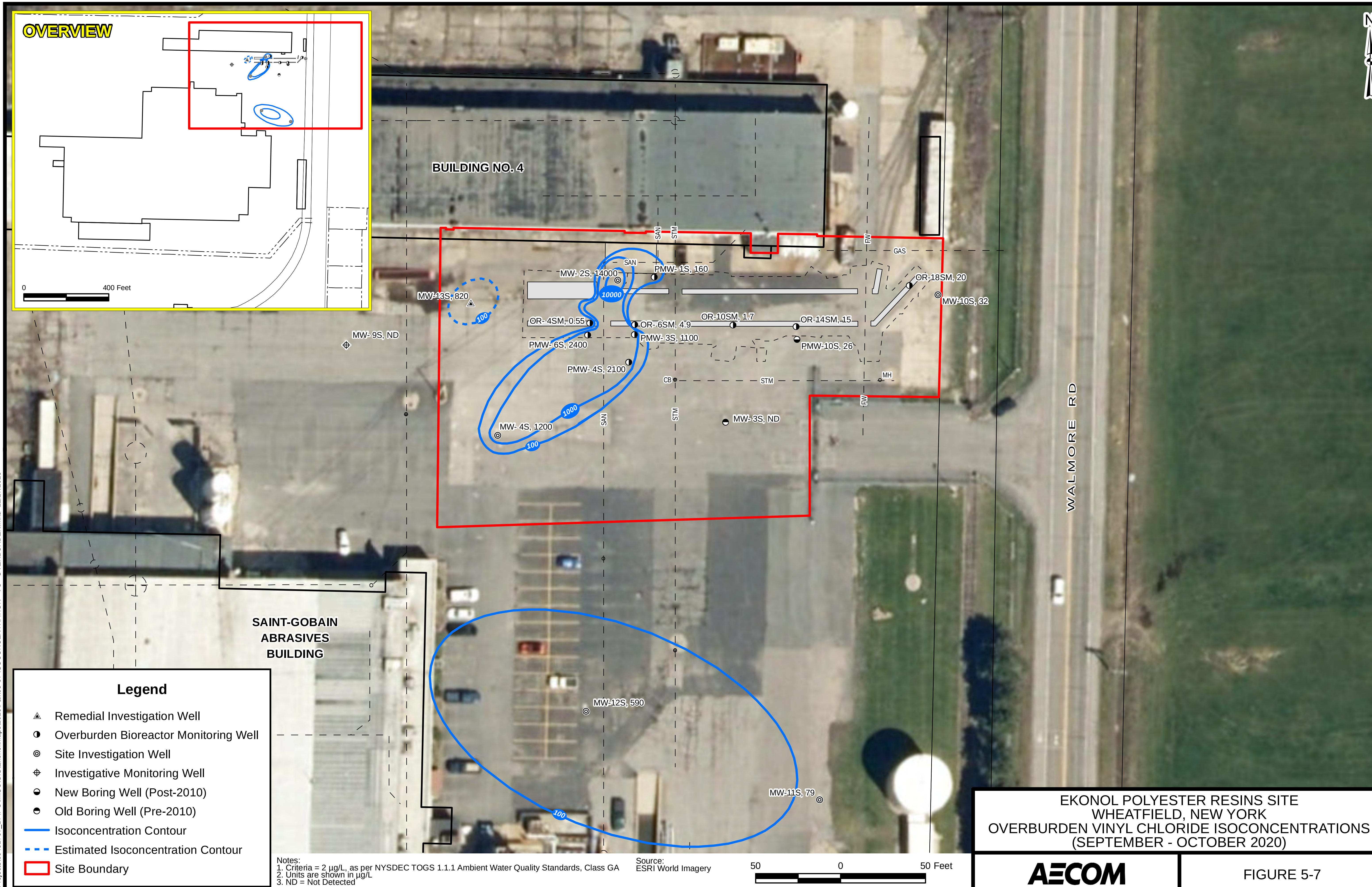
50 0 50 Feet

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
OVERBURDEN CIS-1,2-DICHLOROETHENE ISOCONCENTRATIONS
(SEPTEMBER - OCTOBER 2020)

AECOM

FIGURE 5-6

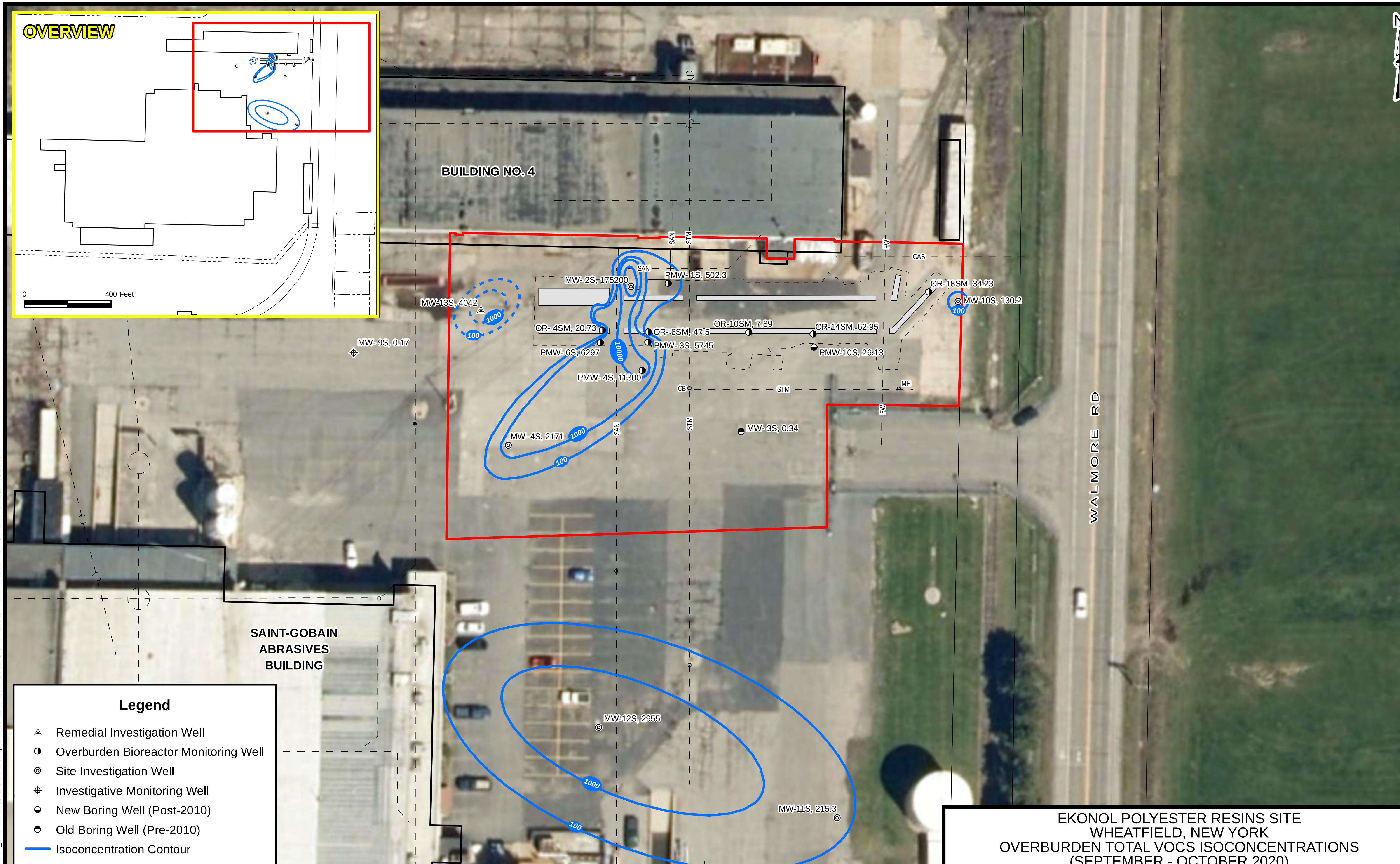
J:\Projects\60481767_BPIPO\MISC\GIS\Ekonol\Maps\2020\Fall\05-06 ISOCONCENTRATION - CIS-1,2-DCE - OVERBURDEN.mxd 12/17/2020



EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
OVERBURDEN VINYL CHLORIDE ISOCONCENTRATIONS
(SEPTEMBER - OCTOBER 2020)

AECOM

FIGURE 5-7



Legend

- Remedial Investigation Well
- Overburden Bioreactor Monitoring Well
- Site Investigation Well
- Investigative Monitoring Well
- New Boring Well (Post-2010)
- Old Boring Well (Pre-2010)
- Isoconcentration Contour
- Estimated Isoconcentration Contour
- Site Boundary

Notes:
1. Units are shown in µg/L
2. Additional VOC Parameters were collected at MW- 3S, MW- 4S, MW-10S, MW-13S, PMW- 1S, and PMW-10S as part of the BCP investigation. These additional parameters are not included in the Total VOC values on this figure.

Source:
ESRI World Imagery

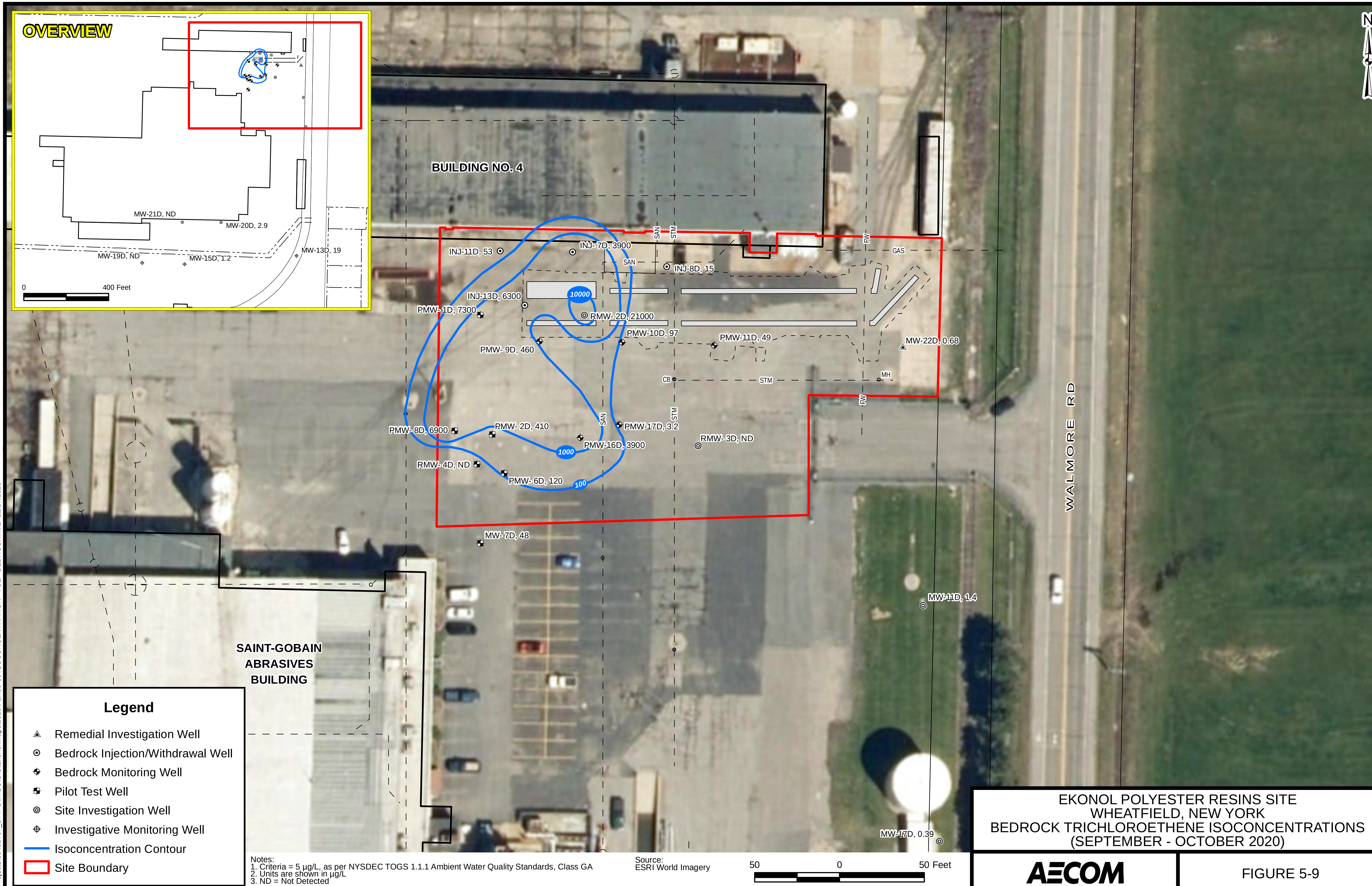
50 0 50 Feet

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
OVERBURDEN TOTAL VOCS ISOCONCENTRATIONS
(SEPTEMBER - OCTOBER 2020)

AECOM

FIGURE 5-8

J:\Projects\60481767_BPIPO\MISC\GIS\Ekonol\Maps\2020\Fall\05-08 ISOCONCENTRATION - TOTAL VOCS - OVERBURDEN.mxd 12/17/2020



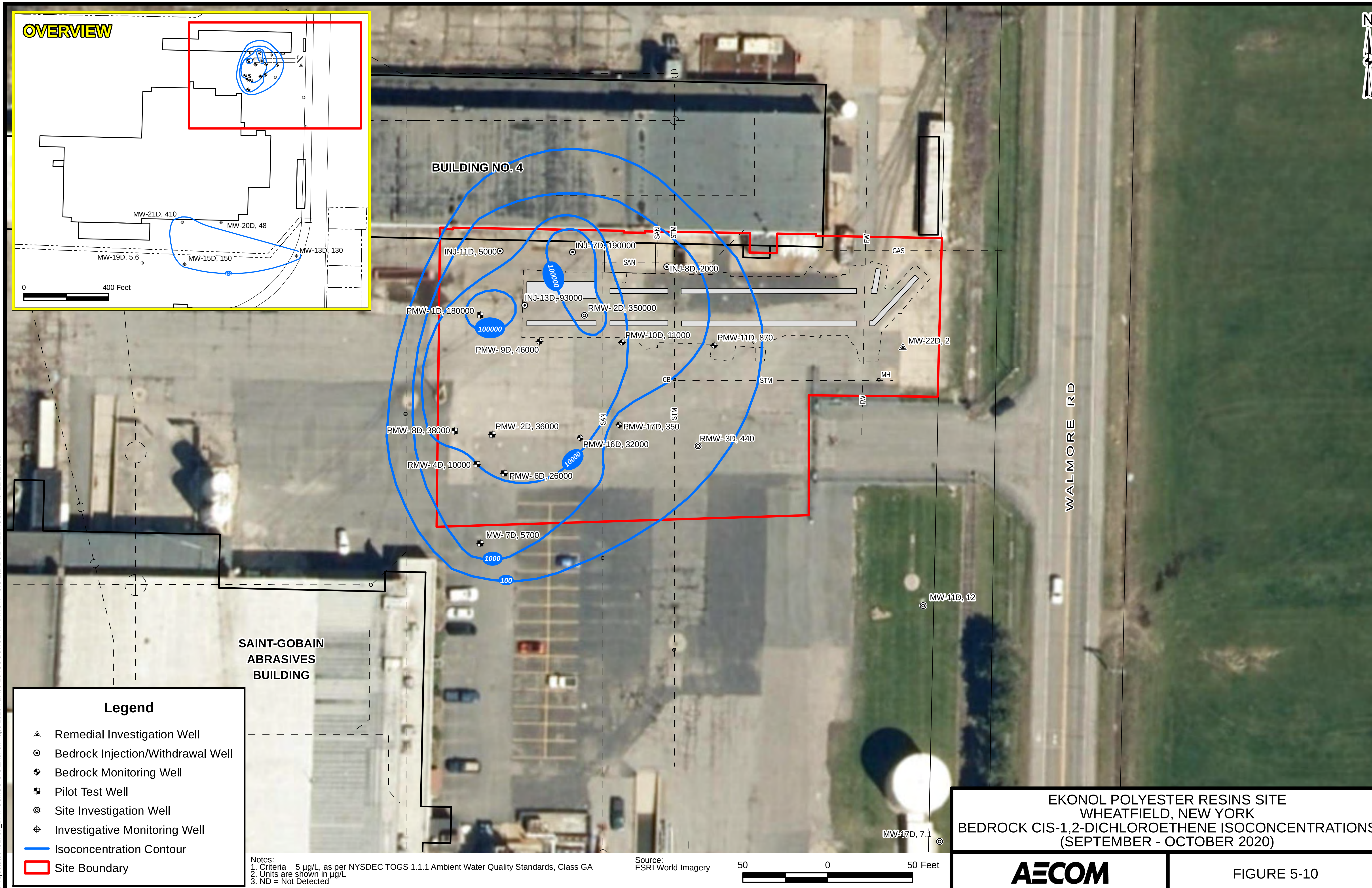
Notes:
1. Criteria = 5 µg/L, as per NYSDEC TOGS 1.1.1 Ambient Water Quality Standards, Class GA
2. Units are shown in µg/L
3. ND = Not Detected

Source:
ESRI World Imagery

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
BEDROCK TRICHLOROETHENE ISOCONCENTRATIONS
(SEPTEMBER - OCTOBER 2020)

AECOM

FIGURE 5-9



Legend

- Remedial Investigation Well
- Bedrock Injection/Withdrawal Well
- Bedrock Monitoring Well
- Pilot Test Well
- Site Investigation Well
- Investigative Monitoring Well
- Isoconcentration Contour
- Site Boundary

Notes:
1. Criteria = 5 µg/L, as per NYSDEC TOGS 1.1.1 Ambient Water Quality Standards, Class GA
2. Units are shown in µg/L
3. ND = Not Detected

Source:
ESRI World Imagery

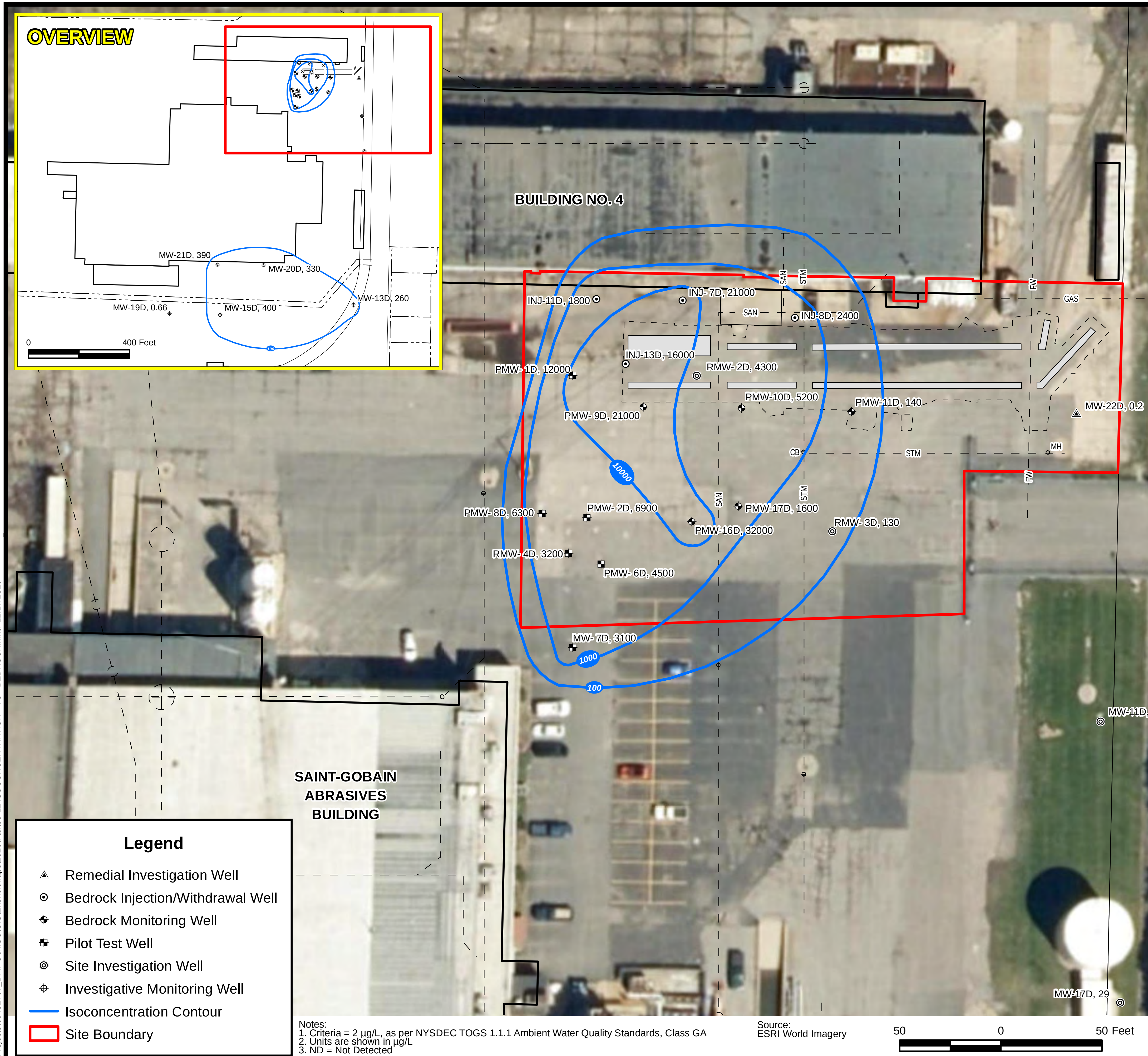
50 0 50 Feet

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
BEDROCK CIS-1,2-DICHLOROETHENE ISOCONCENTRATIONS
(SEPTEMBER - OCTOBER 2020)

AECOM

FIGURE 5-10

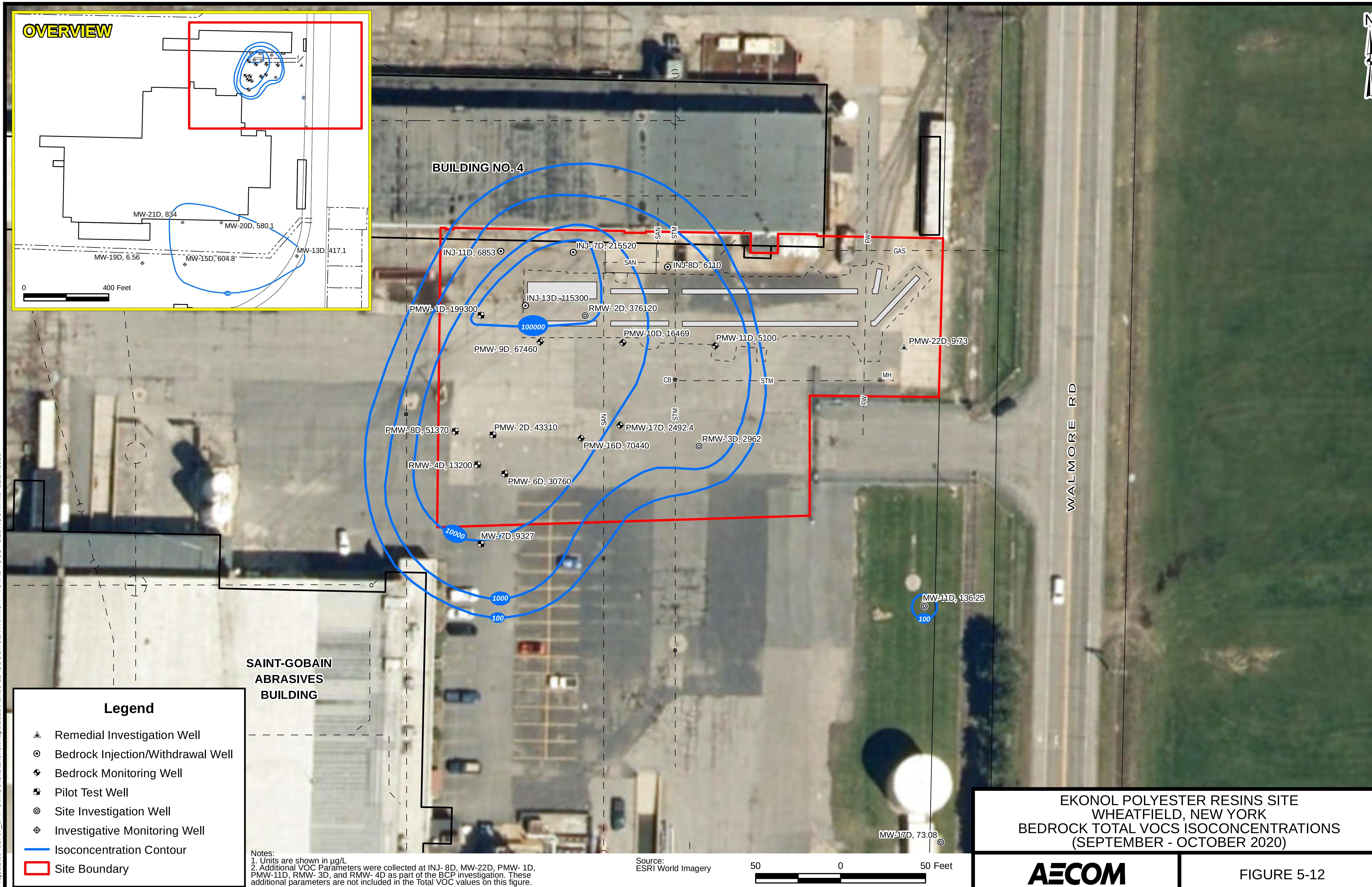
J:\Projects\60481767_BPIPOIMISC\GIS\Ekonol\Maps\2020\Fall\05-10 ISOCONCENTRATION - CIS-1,2-DCE - BEDROCK.mxd 12/17/2020



EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
BEDROCK VINYL CHLORIDE ISOCONCENTRATIONS
(SEPTEMBER - OCTOBER 2020)

AECOM

FIGURE 5-11



Legend

- Remedial Investigation Well
- Bedrock Injection/Withdrawal Well
- Bedrock Monitoring Well
- Pilot Test Well
- Site Investigation Well
- Investigative Monitoring Well
- Isoconcentration Contour
- Site Boundary

Notes:
1. Units are shown in µg/L
2. Additional VOC Parameters were collected at INJ- 8D, MW-22D, PMW- 1D, PMW-11D, RMW- 3D, and RMW- 4D as part of the BCP investigation. These additional parameters are not included in the Total VOC values on this figure.

Source:
ESRI World Imagery

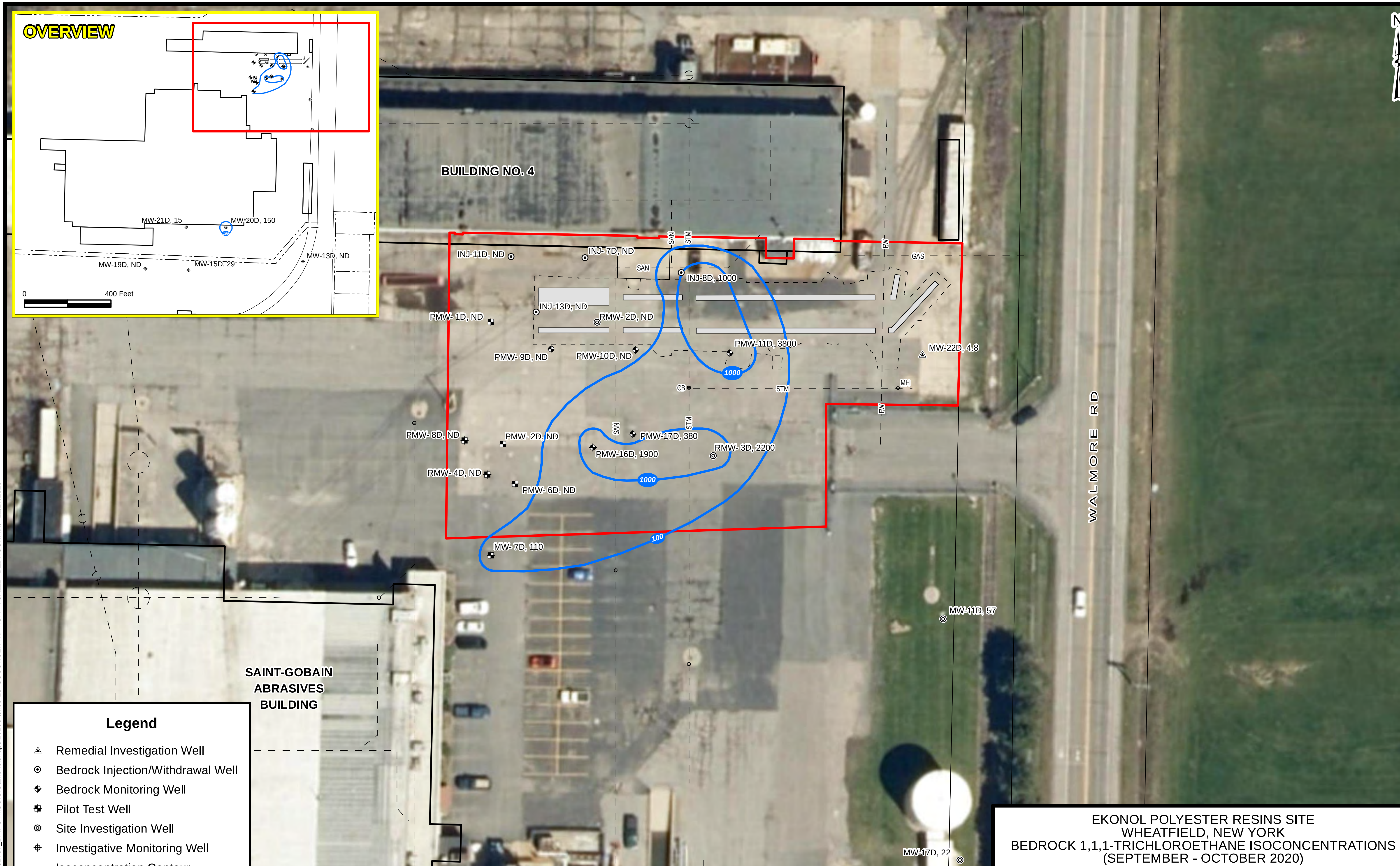
50 0 50 Feet

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
BEDROCK TOTAL VOCS ISOCONCENTRATIONS
(SEPTEMBER - OCTOBER 2020)

AECOM

FIGURE 5-12

J:\Projects\60481767_BPIPOIMISC\GIS\Ekonol\Maps\2020\Fall\05-12 ISOCONCENTRATION - TOTAL VOCS - BEDROCK.mxd 12/17/2020



Legend

- Remedial Investigation Well
- Bedrock Injection/Withdrawal Well
- Bedrock Monitoring Well
- Pilot Test Well
- Site Investigation Well
- Investigative Monitoring Well
- Isoconcentration Contour
- Site Boundary

Notes:
1. Criteria = 5 µg/L, as per NYSDEC TOGS 1.1.1 Ambient Water Quality Standards, Class GA
2. Units are shown in µg/L
3. ND = Not Detected

Source:
ESRI World Imagery

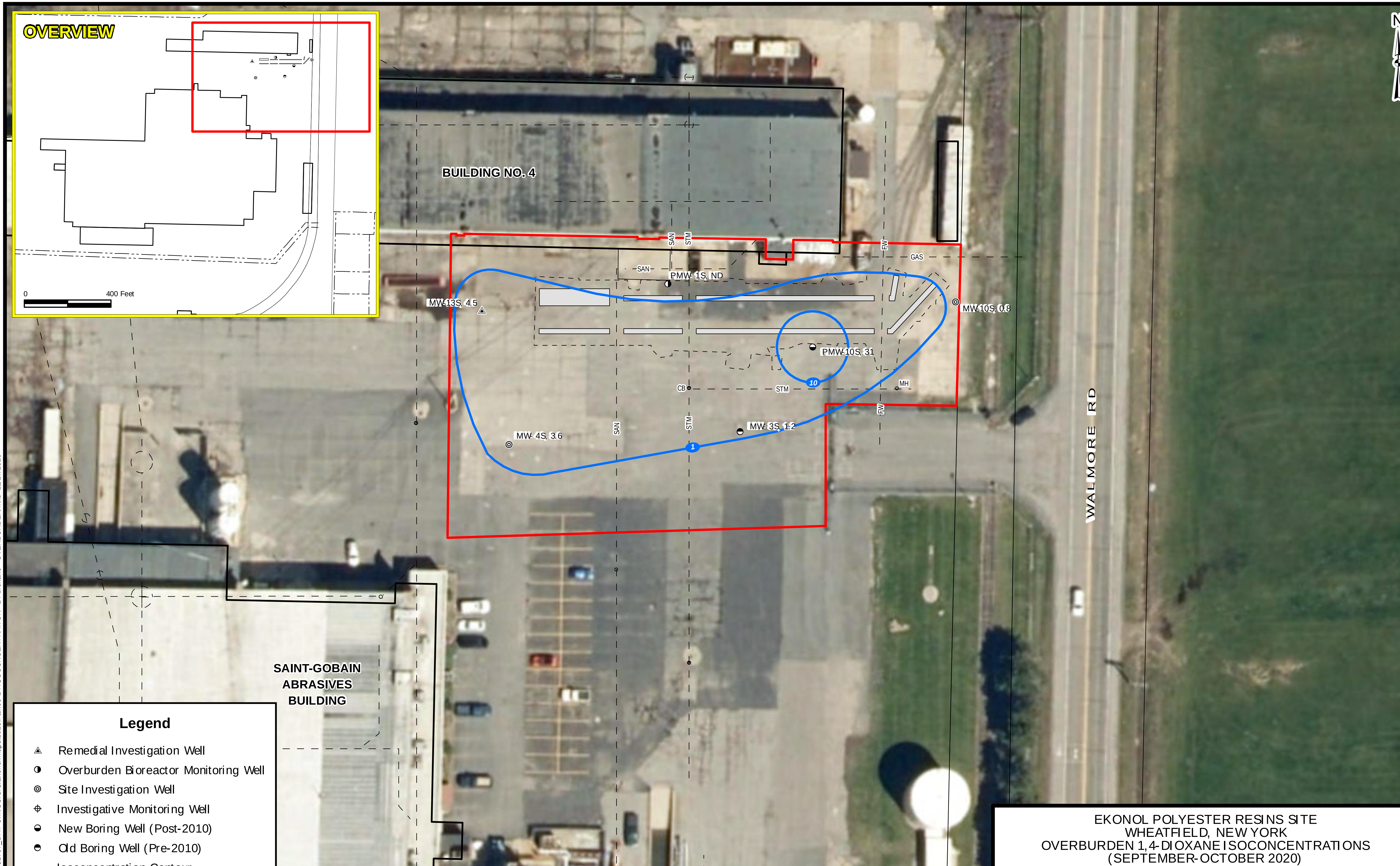
50 0 50 Feet

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
BEDROCK 1,1,1-TRICHLOROETHANE ISOCONCENTRATIONS
(SEPTEMBER - OCTOBER 2020)

AECOM

FIGURE 5-13

J:\Projects\60481767_BPIPOMISC\GIS\Ekonol\Maps\2020\Fall\05-13 ISOCONCENTRATION - TCA111 - BEDROCK.mxd 12/17/2020



Legend

- Remedial Investigation Well
- Overburden Bioreactor Monitoring Well
- Site Investigation Well
- Investigative Monitoring Well
- New Boring Well (Post-2010)
- Old Boring Well (Pre-2010)
- Isoconcentration Contour
- Site Boundary

Notes:
1. Criteria = 1 µg/L, as per NYSDOH Public Water Systems and NYS Drinking Water Standards for PFOA, PFOS and 1,4-Dioxane, August 2020
2. Units are shown in µg/L
3. ND = Not Detected

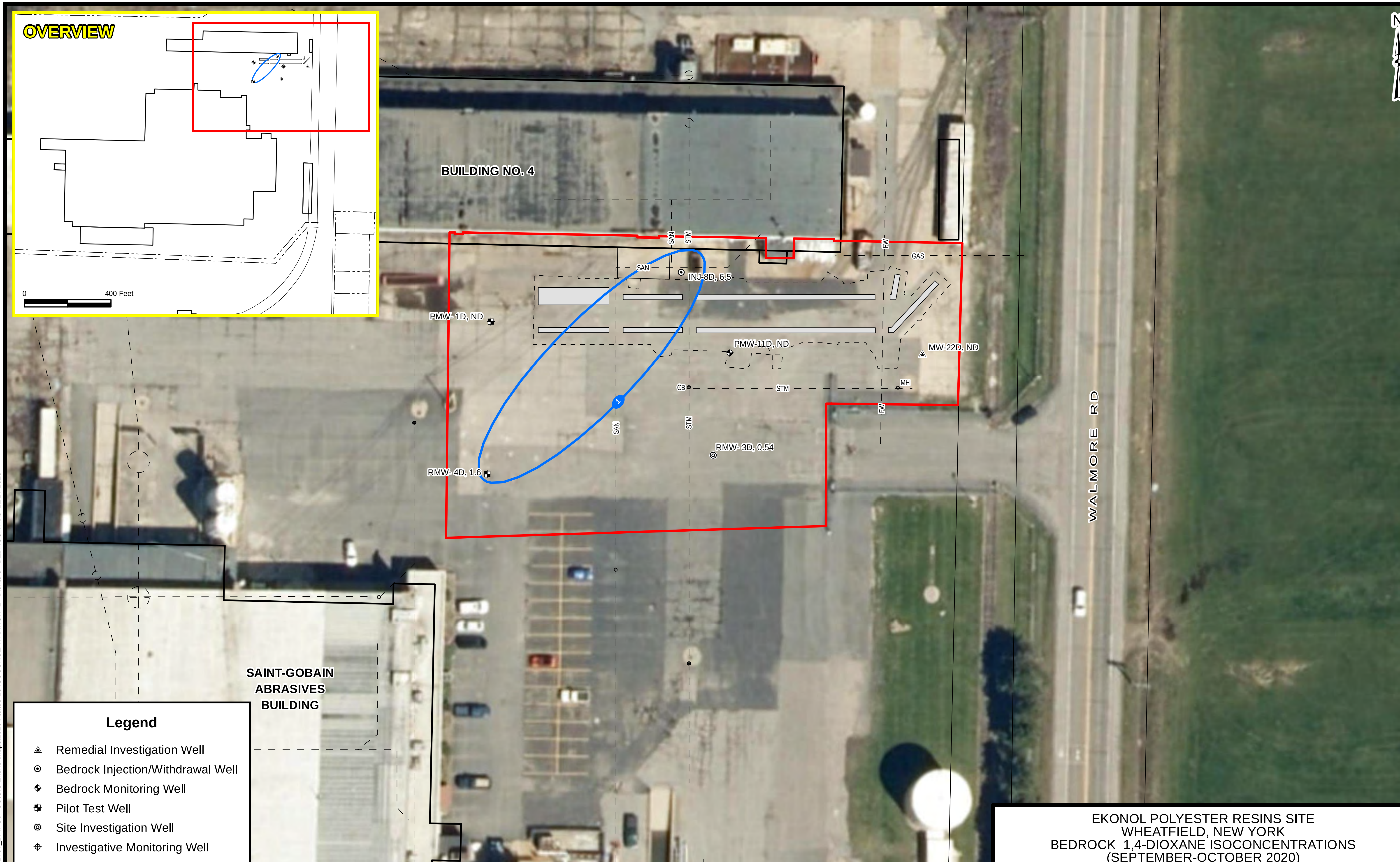
Source:
ESRI World Imagery

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
OVERBURDEN 1,4-DIOXANE ISOCONCENTRATIONS
(SEPTEMBER-OCTOBER 2020)

AECOM

FIGURE 5-14

J:\Projects\60481767_BRPOMSCGIS\Ekonol\Maps\2020\Fall\05-14 ISOCONCENTRATION - 14 Dioxane - OVERBURDEN.mxd 12/17/2020



Legend

- Remedial Investigation Well
- Bedrock Injection/Withdrawal Well
- Bedrock Monitoring Well
- Pilot Test Well
- Site Investigation Well
- Investigative Monitoring Well
- Isoconcentration Contour
- Site Boundary

Notes:
1. Criteria = 1 µg/L, as per NYSDOH Public Water Systems and NYS Drinking Water Standards for PFOA, PFOS and 1,4-Dioxane, August 2020
2. Units are shown in µg/L
3. ND = Not Detected

Source:
ESRI World Imagery

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
BEDROCK 1,4-DIOXANE ISOCONCENTRATIONS
(SEPTEMBER-OCTOBER 2020)

AECOM

FIGURE 5-15

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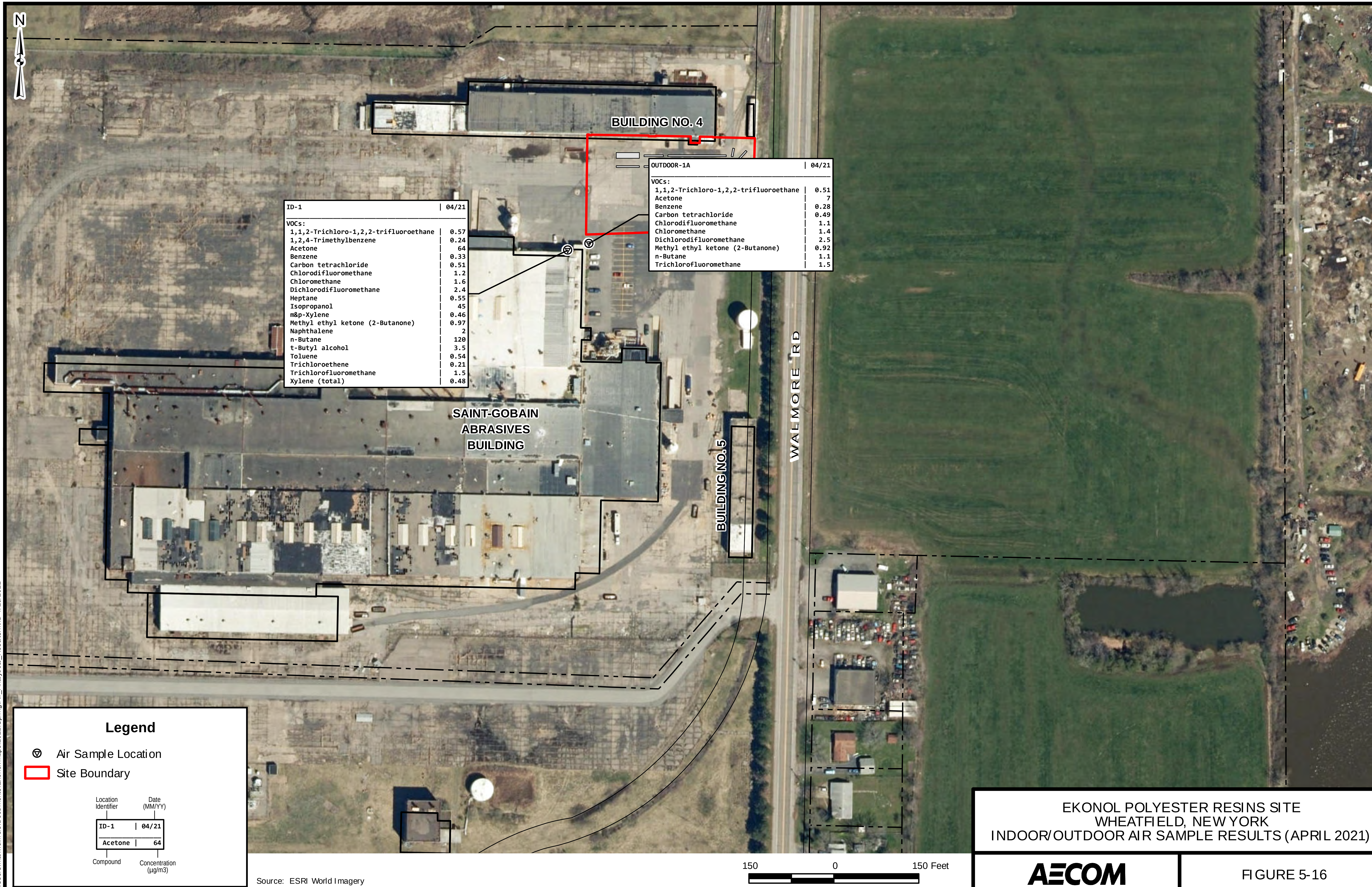

ID-1	04/21
VOCs:	
1,1,2-Trichloro-1,2,2-trifluoroethane	0.57
1,2,4-Trimethylbenzene	0.24
Acetone	64
Benzene	0.33
Carbon tetrachloride	0.51
Chlorodifluoromethane	1.2
Chloromethane	1.6
Dichlorodifluoromethane	2.4
Heptane	0.55
Isopropanol	45
m&p-Xylene	0.46
Methyl ethyl ketone (2-Butanone)	0.97
Naphthalene	2
n-Butane	120
t-Butyl alcohol	3.5
Toluene	0.54
Trichloroethene	0.21
Trichlorofluoromethane	1.5
Xylene (total)	0.48

OUTDOOR-1A	04/21
VOCs:	
1,1,2-Trichloro-1,2,2-trifluoroethane	0.51
Acetone	7
Benzene	0.28
Carbon tetrachloride	0.49
Chlorodifluoromethane	1.1
Chloromethane	1.4
Dichlorodifluoromethane	2.5
Methyl ethyl ketone (2-Butanone)	0.92
n-Butane	1.1
Trichlorofluoromethane	1.5

EKONOL POLYESTER RESINS SITE
WHEATFIELD, NEW YORK
INDOOR/OUTDOOR AIR SAMPLE RESULTS (APRIL 2021)

AECOM

FIGURE 5-16

C:\Users\maxwell.reis\Documents\Ekonol\Maps\2021\Spring\Air_Analytical_Results.mxd 7/29/2021

Appendix A

Monitoring Well Groundwater

Analytical Results Summaries and Trends

Appendix B

Utilities Geophysical

Survey Report

Appendix D

Boring Logs

Appendix D

Boring Logs

Appendix E

Well Development Logs

Appendix F

Aquifer Property Testing

Appendix G

Well Purge Logs

Appendix H

Inspection Records

Appendix I

Data Usability Summary Reports

(Included on CD)

Appendix J

Laboratory Analytical Reports

(Included on CD)

Appendix K

Remedial Investigation – Soil Vapor Intrusion Assessment Letter Report

Appendix L

Fish and Wildlife Resource Impact Analysis Supporting Documents